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## CONGENITAL ANOMALIES OF THE GASTRO-INTESTINAL TRACT CAUSING OBSTRUCTION

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CONGENITAL malformations, like most unanswerable conundrums, continue to fascinate us and to offer a constant challenge to our speculative gymnastics. We like to theorize about the unknown, and then to try to find evidence in support of our pet theory.

The problems involved in the finding, the explanation of, and the therapeutic handling of congenital obstructions in the gastro-intestinal tract are diverse and interesting. The new born babe who cannot retain his feedings, and continues to vomit after a short trial of the simpler things, such as change in character, amount and intervals of feeding and the administration of atropine, demands an immediate investigation into the cause of vomiting, and its eradication if the life of the babe is to be spared. Only enough time should be consumed in the various examinations to arrive at a satisfactory diagnosis. While the investigations are in progress every effort should be made to keep the infant's circulatory physics and chemistry well within normal physiologic limits if it is hoped to be able to correct a mechanical defect by surgical means, and emerge from the process with a living baby.

It has been my good fortune to have seen several of these obstructions in infants, and it is with a desire to record my cases, and to comment upon some of the specific features involved in these cases, that this paper is being presented.

Read before the Sixth Annual Assembly of The Southeastern Surgical Congress, in Jacksonville, March 11, 12 and 13, 1935.

Many collective reviews of this subject have been published. The impressions I get from reading them are:

1. That these deformities are considerably more common than I had thought them, which fact adds its bit to the practical value of the subject under consideration. Davis and Poynter<sup>1</sup>, in 1922, collected reports of 401 cases of congenital occlusion of the intestines between the pylorus and the anus. They were distributed as follows: duodenum 134, jejunum 60, ileum and cecum 101, colon 39 and multiple atresias 67.

2. That numerous etiologic theories have been offered in explanation, some logical, and some rather far-fetched. Some of the most popular ones are:

- a. Segmental arrest of development during certain known periods of the embryologic sequence of events such as tenth week of fetal life, when the duodenum and certain other portions of the intestinal tract are practically solid from proliferation of the lining epithelium too rapidly for the increase in diameter of the gut.

- b. Developmental accidents such as volvulus or intussusception.

- c. Failure of development of the intestinal segment in question, or progressive decrease in an adequate blood supply to that segment.

- d. Fetal disease such as peritonitis or localized enteritis.

To the many others I wish to add a theory which is appealing to me, which I have not seen mentioned, and which is just as apt to be wrong as any of the others: a development of the sympathetic nervous system which is faulty either as to qualitative or quantitative innervation of the gastro-intestinal tract, or both, in the involved segment. This might, it seems to me, give rise to increased spasm, increased tone, work hypertrophy of muscular walls inside of an inelastic tube, and finally obstruction, as is seen in pyloric stenosis. It might on the other hand produce localized vasoconstriction, resulting in failure of development from inadequate blood supply. Adding weight to this theory is the fact that these conditions are more common at sites where the gross anatomy, histology, physiology and nerve supply change in going from one segment into another; the cardia, the pylorus, the duodenum, the upper jejunum, the ileocecal region and the anus. In addition there

are accumulating records of relief from pylorospasm, spastic colitis and Hirschsprung's disease in older patients from direct attack upon an unbalanced sympathetic nervous system.

The diagnosis of these conditions resolves itself largely into the ascertaining of the location and extent of the lesion. Clinically they are typically obstructions, with vomiting and absence of stools as the predominant symptoms referable to the gastro-intestinal tract. The general symptoms due to dehydration, intoxication and altered blood chemistry are more or less marked in the individual case, depending upon the completeness of the obstruction, its location, its duration, and the success or failure of efforts in treatment to combat this altered physiology up to the time the case is encountered. One of the simplest tests for complete atresia of which I have knowledge is that which was described by Sidney Farber<sup>2</sup> in 1933. It consists of microscopic examination of the meconium from a suspected case. It is based upon the fact that hair, lanugo, and cornified epithelium are normal constituents of normal meconium. They are derived from the skin of the fetus, and introduced by the swallowing of liquor amnii. He has worked out a simple laboratory method of examining for cornified epithelial cells. The absence of this constituent in the meconium is proof of the existence of complete atresia. I did not know of this test when I was studying my cases. The abdominal examination and the use of a tube in the stomach for purposes of emptying and inflation, and if possible passage of the tube into the duodenum may give very suggestive evidence; it is my belief however that the x-ray is our surest, most selective, and quickest method of diagnosis. It is of great value and at times gives conclusive information in its outlining of gas shadows. If this does not solve the problem it is a simple matter to outline the gastro-intestinal tract with the barium meal or enema or both. Some objections have been raised to the use of a barium meal on the basis of the danger of its clogging up a subsequent anastomotic opening, made for purposes of short circuiting the obstruction, or of having a similar effect upon the lower collapsed segment of intestine. I have easily overcome this objection by the simple expedient of introducing a Levine tube into the stomach and duodenum, after the study is made, and aspirating the meal by the Wangenstein

continuous suction method of upper intestinal decompression. We have watched the progress of this emptying under the fluoroscope, and it can be done quickly and easily. If it is necessary, injection of water through the tube, alternating with the suction, will enable one to wash out practically all of the barium within a short time.

The treatment of the lesion is always surgical. The treatment of the patient, on the other hand, is both medical and surgical. It is most essential in these cases to make haste slowly. One should never allow himself to be stampeded into a hurried operation on a dehydrated and toxic infant. It is, I believe, always possible and desirable to delay surgical intervention until a planned preoperative regimen has converted the case from one of the gravest of conditions to one of somewhere nearly normal physiology. I believe that this can, with our present knowledge and facilities, be accomplished without jeopardizing the chances of surgical correction of the lesion at a later period. The essential elements of the pre-surgical regimen are:

1. Restoration of the physics and chemistry of the circulation to near physiologic normal by the introduction of water, food (glucose) and the electrolytes, preferably in a vein, by a tied in cannula, as continuous venoclysis.

2. Decompression and detoxication of the gastro-intestinal tract above the lesion by the use of duodenal-nasal suction according to the plan popularized by Wangensteen<sup>3</sup>, which restores tone to overdistended intestines and lessens edema, improving the circulation in involved sections. At this point let me pay tribute to Wangensteen and others whose writings have been the occasion of popularizing this simple method which has made such a great advance in the treatment of intestinal obstruction. In my hands it has literally restored hope to the formerly hopeless cases, and reestablished my confidence in my own ability to handle these very serious cases.

There is little to be said relative to surgical technic as each case is a peculiar problem unto itself and will require its own solution. In general I believe firmly in and practice local anesthesia in all abdominal operations in infants, having the baby suck a sugar teat, as suggested by Stuart McGuire, during the operation. Infiltration or nerve block of the abdomi-



nal wall and the introduction of 25 cc. of 0.5 per cent novocain into the peritoneal cavity, leaving it ten minutes before making the incision, will give a very satisfactory anesthesia. The work of course is tedious and requires small instruments, small sutures and fine needles. Some mention of special technique will be made in the reports and comments upon our cases.

In order that the case reports may have an orderly sequence, they will be taken up in the order of their occurrence from above downward, instead of in the order of their occurrence in my experience.



FIG. 1. X-ray film taken when the baby was two days old, showing the slight amount of barium in the stomach, and typical spindle-shaped esophagus closed at the cardia and dilated above. This film was taken one hour after the administration of barium and after the administration of atropine to the physiologic limit. (Case 1.)

NOTE: This film was unfortunately reversed in the course of reproduction.

#### REPORT OF CASES

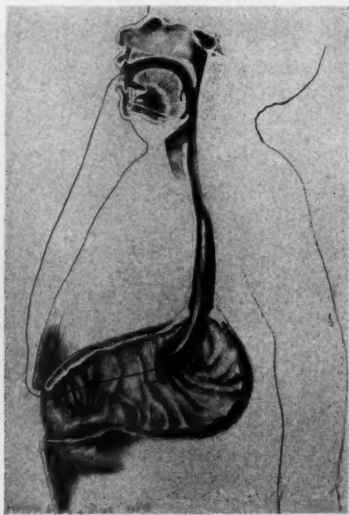
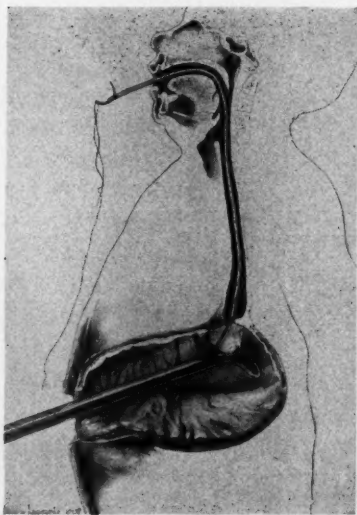
##### CASE 1. *Congenital stenosis of the cardia.*

A boy baby of healthy parents was delivered normally on Feb. 17, 1928. General examination was negative. Feedings would be swallowed and after a few moments vomited just as taken. The vomiting was rather forceful at times. Apparently nothing reached the stomach.

When he was two days old, x-ray of the chest was made in search for an enlarged thymus or some other cause for the apparent obstruction. The first film showed nothing except a shadow near the hilus of the left lung which was thought to be an enlarged mediastinal gland. The baby was then given a barium mixture with a medicine dropper and a slight amount trickled through into the stomach, but most remained in the esophagus, churning

about for an hour in spite of administration of atropine to the physiologic limit. Finally the barium was vomited. Efforts were made to pass catheters and bougies through the esophagus into the stomach, but they were unsuccessful. A recheck with barium was made the next day with the same results. The baby was becoming dehydrated and something had to be done. Two courses were discussed, and it was decided that gastrostomy with later dilatation of the esophagus was less dangerous than esophagoscopy.

Under local anesthesia a No. 16 F. catheter was introduced into the stomach and fixed in position. Feeding through the tube was begun immediately, and the baby began to improve and to gain weight normally. At the end of ten days the tube was removed from the stomach, and a cystoscope passed into the



- FIG. 2. Braasch cystoscope introduced through gastrostomy opening and cardiac orifice catheterized with a No. 6 Fr. ureteral catheter. Thread is being attached to the end of the catheter to be withdrawn through the gastrostomy.
- FIG. 3. Continuous string to which has been tied a soft rubber dilator which has been pulled through the gastrostomy into the cardia.

stomach through the gastrostomy opening; the cardiac orifice was located by following the lesser curvature upward, and a No. 6 ureteral catheter passed through it. The orifice had the appearance of a ureteral meatus in the bladder, and was about the same size. The catheter passed rather easily upward through the esophagus, and caused gagging when it reached the posterior pharynx. When the baby gagged the end of the catheter was picked up with a hemostat and withdrawn from the mouth. A silk fishing line was fixed to its end and the catheter then withdrawn, thus establishing a through and through string, passing through the constricted cardia and out through the gastrostomy opening. The next day dilatation of the stricture was begun,

using a set of Jackson dilators. These were pulled through the cardia in increasing sizes until a number 24 F. was passed. We completed the dilatation with hydrostatic force, by injecting a measured quantity of water into a dilator made of a glove finger. None of the manipulations was accompanied by shock or other untoward reactions, and none seemed to give the baby much discomfort.

Within three weeks the baby was taking a formula by mouth normally and a recheck of the cardia with the x-ray showed no delay in the barium at this point. The gastrostomy tube was left in place for three weeks more, in order to be certain that there would be no return of the obstruction, and was then



FIG. 4. Photograph of the patient at the age of 8. (Case 1.)

removed. The gastrostomy wound was slow in closing, so three weeks later, under local anesthesia, the stomach was freed from the abdominal wall, the opening closed, the stomach dropped back into the abdominal cavity and the wound closed. Healing took place without incident.

The history of the child since then has been that of a perfectly normal and healthy child, who is now a big, husky lad, without any gastrointestinal disturbance whatever.

#### CASE 2. *Congenital atresia of the duodenum.*

On June 8, 1929, the child of healthy parents began vomiting a few hours after his normal delivery, and continued to vomit every feeding, losing  $2\frac{1}{2}$  pounds in weight in four days. There were no stools except meconium. The

vomit was not of the projectile type usually seen in pyloric stenosis, but there were visible and marked peristaltic waves across the upper abdomen, and the epigastrium was quite distended. General physical examination was negative. X-ray examination with a barium meal showed a complete obstruction just beyond the pylorus. A diagnosis of congenital obstruction of the duodenum was made and operative investigation advised. After a few days of administration of normal saline solution by rectum and under the skin the baby was subjected to abdominal section under local anesthesia on June 16 at 8 days of age. The entire duodenum was replaced by a hard cord-like structure, smaller than a lead pencil, occupying its normal position, and ending in a normal jejunum at the mesocolic opening. The remainder of the intestines was collapsed but normal in appearance otherwise. The stomach

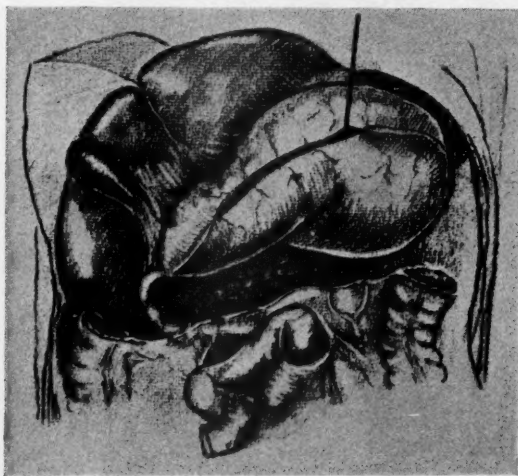


FIG. 5. In the drawing the transverse colon, the mesocolon and the omentum are shown as having been cut away in order to show the atresia of the duodenum as it appeared in this case. (Case 2.)

was large and dilated. The liver and pancreas seemed normal to inspection and palpation, though we did not see how there could be room enough in the duodenum, granted that it had a lumen at all, for the delivery of the pancreatic and liver secretions. This was a case of my colleague, Dr. T. S. Field, and we were operating together. We decided that a gastro-enterostomy was the only thing offering any hope of relief, so one was done. The baby stood the operation well. We left 200 c.c. of normal saline solution in the peritoneal cavity and the abdomen was closed. The baby did well until two days later and when he began vomiting again. A recheck by the x-ray showed that the gastro-enterostomy opening was practically occluded, only a few drops of barium entering the jejunum, so the incision was reopened on June 21 and the operative site inspected. It was found that the anastomosis had broken

loose in one place and there were a mass of adhesions at this point which were causing an obstruction. It was resutured, and a nasal duodenal tube inserted into the stomach and out through the gastro-enterostomy opening into the first loop of jejunum. Feedings were then resumed by injecting them through the duodenal tube. The baby did not do well after the second operation, gradually lost ground, and died two days later. No autopsy was permitted.

*CASE 3. Obstruction of first portion of the jejunum from a volvulus.*

Baby D., the second child of healthy parents, delivered by caesarian section, was referred to me by Dr. Thomas E. Buckman, with whom the case was handled thereafter. The baby was eight days of age and there was a history of his having vomited every feeding since birth. The vomiting was of a

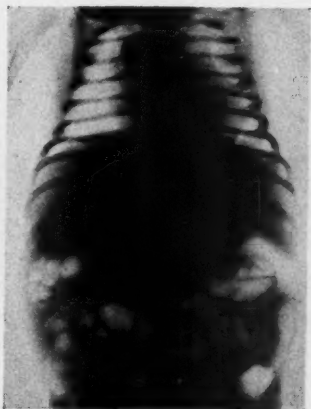


FIG. 6. X-ray film taken for the purpose of localizing the lesion accurately shows the column of barium to stop abruptly at the beginning of the jejunum. (Case 3.)

regurgitant type and not the projectile type which one sees in pyloric stenosis. General physical examination was negative except for a rounded distended epigastrium, attributed to a dilated stomach. There were plainly visible waves of peristalsis passing across the upper abdomen, and peristaltic sounds which were plainly audible without the use of a stethoscope. The baby had lost  $1\frac{1}{2}$  pounds since birth, in spite of the administration of fluids by rectum and by hypodermoclysis. X-ray examination with the barium meal revealed an obstruction at the beginning of the jejunum. The duodenum filled normally and the barium moved back and forth in it and then returned to the stomach, with a very faint trace entering the jejunum after several hours. Atropine was administered to physiologic limit without influence on the obstruction.

On Aug. 18, 1934, when the baby was eight days old, we opened the abdomen under local anesthesia, through an upper right rectus incision. The stomach was greatly dilated. The pylorus and duodenum were normal. The



transverse colon was raised up and we found a volvulus of the first 8 or 10 inches of the jejunum obstructed at the foramen through the mesocolon. The venous return of blood was somewhat occluded and the color of the twisted gut was cyanotic. The color cleared up when it was untwisted. The cause of the volvulus was a congenital peritoneal band, occupying the position of the ligament of Treitz, but attached by its inferior end to the jejunum 10 inches below its beginning instead of at the point where it comes through the mesocolon. This had acted as an axis around which the pulled up loop had wound itself. The attachments of this ligament were cut and it was removed in order to prevent a recurrence of the volvulus, and the abdomen was closed. The baby made a satisfactory recovery from the operation except for some postoperative vomiting for three days, which was relieved and controlled by

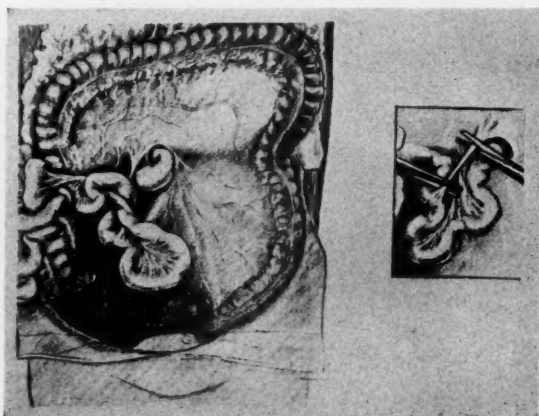


FIG. 7. The drawing on the left shows what was found at operation, a twist of the upper jejunum around a long ligament of Treitz which was attached at a point about 8 inches below the emergence of the jejunum through the mesocolon. The insert shows the untwisting of the volvulus and the severing of the abnormal band. (Case 3.)

the use of the duodenal suction. The history since leaving the hospital is that of a normal baby, taking the same food in the same amounts as a normal one, and growing satisfactorily, without any symptoms referable to the gastrointestinal tract. He is now 7 months of age, and normal in every way.

#### CASE 4. *Congenital atresia of terminal ileum and entire colon.*

On Jan. 27, 1926, a baby, 3 days old, who had vomited constantly since birth, was referred to me. There had been no stools, and enemas had been returned immediately without color. The baby was badly dehydrated. The upper abdomen was distended and the site of visible peristalsis. The vomiting was not projectile. There was plainly palpable in the lower right quadrant of the abdomen a sausage-shaped, doughy mass, about 4 inches long and freely

movable. There was no abdominal rigidity nor tenderness. Temperature was normal and the pulse elevated to 140. No other abnormalities were found on physical examination. X-ray showed that no barium passed the pylorus.

Operation was done on the day of admission, the abdomen being opened under local anesthesia. The mass which had been felt proved to be a loop of ileum about 5 inches long, greatly dilated, to the diameter of  $1\frac{1}{2}$  inches, and packed full of meconium of a dark green, doughy or rubbery consistency. The coils above this were somewhat dilated. Below this coil, about 10 inches of the terminal ileum, the cecum, and entire colon, down to the rectum, were replaced by what appeared to be a solid fibrous cord, having the shape and

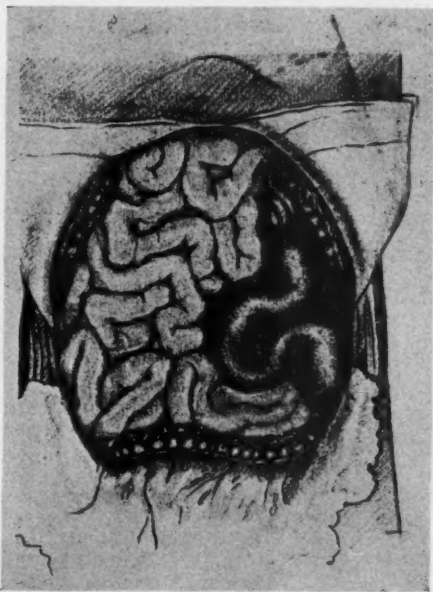


FIG. 8. This drawing, made with the abdomen uncovered, shows the atresia of the terminal ileum and entire colon, with the enormous distention of the loop of ileum containing inspissated meconium, lying proximal to the occluded terminal ileum. (Case 4.)

length of the normal intestines, but only about the size of a small lead pencil. Apparently there was no lumen through them. A split muscle incision was made in the lower right quadrant, clamps inserted through it, and the ileum clamped just above and below the dilated and filled loop. This loop was then cut away between clamps, and the proximal and distal ends brought out through the split muscle incision, the clamps left on and the incision closed. Two hundred cubic centimeters of normal saline solution was left in the peritoneal cavity. The baby died three days postoperative without having entirely recovered from the shock of the operation, and without resumption

of function of the intestinal tract above the obstruction. At postmortem it was found possible to force water through the entire length of the colon, proving that a lumen was present.

#### COMMENT

CASE 1. As far as I can find in the literature this is the youngest case of cardiac stenosis which has been reported. Beck has reported a case in a baby 2 months of age, but the diagnosis was not proven by x-ray examination and the trouble was cured by passing tubes into the stomach from above.

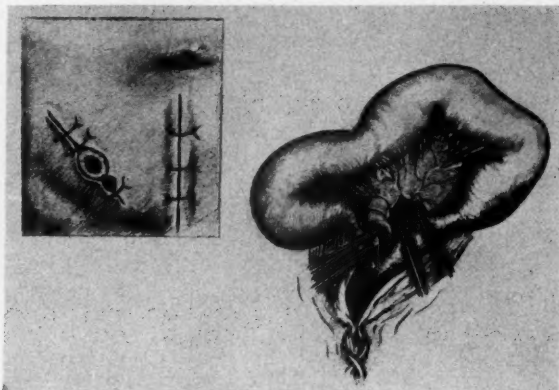


FIG. 9. The distended loop of ileum is being cut away between clamps. The insert shows the disposition of the ends of the gut through a slab wound after removal of the clamps on the second day. (Case 4.)

The method used in getting through the stenosis with a ureteral catheter passed through a cystoscope was in our case a relatively simple matter, and we commend the method to anyone confronted with a similar problem.

CASE 2. I feel that this patient, as well as the fourth, probably did not have proper preoperative preparation in the administration of water, electrolytes and food by vein before the operation was done. We did not know then as much about the necessity of this as we do now. The breaking open of a part of the suture line and the resulting obstruction of the gastro-enterostomy opening was probably the cause of the baby's death. It was an unfortunate accident. I feel, how-

ever, that there was no certainty that there was any lumen at all in the duodenum, in which case there would have been no possibility of delivery of either bile or pancreatic secretion to the intestinal canal, in which case the baby would have died anyway.

Case 3. This case was one of mechanical obstruction, requiring surgical relief, in which we used the proper preoperative treatment, designed to return the circulation to normal physiology, and in which we used the Wangenstein duodenal suction postoperatively at the opportune time. Both of these essential parts of the treatment, I believe, contributed largely to the child's recovery.

Case 4. As was stated before, I operated upon a toxic and dehydrated baby, which was bad judgment, and would not be done at this time. I feel that the disposition of the dilated segment of gut which was packed with inspissated meconium, by a rapid resection, leaving the two ends out of a split muscle wound, was the procedure of choice in this case. Although some writers have advised doing an anastomosis in cases of this kind, I think that what I did was much less of a shocking procedure; following the well thought out and well tried principle in intestinal surgery in the adult, namely that of graded procedures in bad surgical risks, and the use of the Mickulicz principle of exteriorization of the cut ends of the gut, to be later followed by reestablishment of the intestinal continuity. In addition to the above, in this particular case I was not sure that there was a lumen in the terminal ileum and colon. I reasoned that if there was one it was so small that it would require a good bit of dilatation, probably hydrostatic in type, before it could carry on its intended function, and that this leaving out of the ends would allow me to do this. Of course the death of the baby left the eventual outcome a matter of pure speculation. However, if I were called upon to treat a similar case in the future, my only change would be in the preoperative treatment.

I have learned, since preparing our paper, that this case is almost an exact duplicate of a case in a 1½ day old infant, reported by Dr. John J. Morton, of Rochester, N. Y., in a paper to be published in the near future.

## SUMMARY

As a result of my limited experience, and of what I can learn of the experience of others, we are justified in concluding as follows:

1. These disabilities are not particularly rare, and should be suspected and searched for in all cases of persistent, intractable vomiting in the new born.

2. No one knows the cause of these defects, nor would they know how to avoid them if they knew the cause.

3. X-ray study with the use of the opaque meal is the surest, speediest, and most direct method of diagnosis, and should be used in the beginning instead of wasting a lot of time in speculation and futile efforts to arrive at proper conclusions by less direct methods.

4. Proper, deliberate, planned, medical rehabilitation of the patient's circulation, plus nasal-duodenal suction decompression of the gastro-intestinal tract above the lesion, under the care of a competent pediatrician is essential. This should be followed by surgical correction of the lesion in the most direct, simple and least shocking method which can be used in the individual case, using a two stage operation whenever indicated. This combination should save a good many of these babies who are now sacrificed on the altar of dilatory practices.

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## SURGICAL CONSIDERATION OF THE TONSILS AND ADENOIDS

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**I**N 1884 Waldeyer, of Berlin, described a group of lymphoid masses that surround the alimentary tract as it joins the respiratory tract at the beginning of the pharynx. This composite group is known as Waldeyer's ring. The separate masses of lymphoid tissue which constitute this ring are known as adenoids, and eustachian, faucial and lingual tonsils. These are connected by submucous strands of lymphoid tissue. An acute infection of one of these masses usually means an acute infection of all. The same is true of chronic infection, and hypertrophy or hyperplasia of one mass means hypertrophy or hyperplasia of all.

Some investigators believe that this ring serves as nature's first line of defense against the attacks of pathogenic bacteria. Most authorities agree, however, that by the age of 4 it has become battleworn with the constant bombardment of bacteria, and pathogenic organisms not only pass through the lymphoid tissue into the cervical lymphatics and blood stream, but actually incubate and multiply within the tissues. Hence Waldeyer's ring loses its protective power and often becomes a harbor of infection, frequently producing disease in remote parts of the body. Indeed it stands out pre-eminently as a septic focus. It probably has no physiologic function after the age of 4, so, fortunately for the patient, this septic focus can be eradicated without detriment to health. Fortunately, too, the ring is easily accessible to radical surgery.

Most of us, if not all, are familiar with the anatomy and histology of the faucial tonsil. It must be remembered that a crypt may become sealed by an inflammatory exudate, and a normally draining crypt thus converted into a closed abscess. Infection from this ring can reach distant parts of the body through the lymphatics, the blood stream and by aspiration and drainage. Bacteria from the faucial and lingual tonsils travel into and through the anterior deep cervical nodes

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along and beneath the anterior border of the sternomastoid muscle. Bacteria from adenoids and eustachian tonsils travel into and through the posterior deep cervical nodes along and beneath the posterior border of the same muscle. Infection from the ring never involves the superficial cervical lymphatics.

Considering Waldeyer's ring as nature's first line of defense against pathogenic bacteria, the deep cervical chain of lymph nodes probably would be the second line of defense. Bacteria from a focus of infection in the ring pass through this chain to reach the general circulation. These nodes are frequently palpable, denoting disease. The tracheal and bronchial lymphatic nodes receive efferent vessels from the anterior group of the deep cervical chain; hence they are involved in acute and chronic infections of the faucial and lingual tonsils. Investigators generally agree that a tuberculous infection from the faucial and lingual tonsils may reach the apices of the lungs by this route.

Bacteria from a focus of infection in the faucial and lingual tonsils drain into the tonsillar lymphatic node, located just below the angle of the mandible. When this gland is palpable it means that infection has passed through the tonsil barrier and is on its way to the general circulation. Hence this is an indication for tonsillectomy. The efferent vessels of the anterior and posterior deep cervical lymphatics unite to form the right jugular trunk. The right jugular trunk unites with the right subclavian trunk to form the right lymphatic duct. The right lymphatic duct drains into the right innominate vein, a tributary of the superior vena cava. The anatomic arrangement on the left is slightly different. It is generally agreed that bacteria from Waldeyer's ring enter the blood stream by this route and are then conveyed to other parts of the body.

Bacteria from a focus of infection in the faucial and lingual tonsils pass into the pterygoid plexus of veins in the tonsil bed. Then they pass into branches of the internal jugular vein, through the internal jugular to the innominate, thence into the superior vena cava and throughout the system.

The anatomic location of Waldeyer's ring is such that infection from this ring is frequently carried by aspiration and

drainage through the larynx and trachea into the bronchi and aveoli of the lungs. Therefore a focus of infection in the tonsils and adenoids becomes an etiologic factor in various lower respiratory infections, pulmonary tuberculosis and probably lung abscess. Drainage of bacteria into the alimentary canal may perhaps produce such pathologic lesions as peptic ulcer and cholecystitis.

In dealing with septic foci of Waldeyer's ring, the only method of treatment worth considering is complete surgical removal of all lymphoid tissues which harbor the foci. The various surgical technics have their advocates and any one is good provided the surgeon is efficient in removing every vestige of infected lymphoid tissue.

In examining a tonsillar fossa a few weeks after surgical removal by any method, it is not uncommon to find lymphoid tissue, especially at the upper and lower poles. This tissue may harbor a focus of infection, and it would not be logical to expect satisfactory results from such an incomplete operation.

The electro-coagulation method of removing tonsils is not to be encouraged. There are a few surgeons technically able to secure good results, but many fail to remove all of the lymphoid tissue, and in their enthusiasm for thoroughness, traumatize the superior constrictor muscle of the pharynx. Frequently the focus of infection remains. An uncomfortable throat is likely to follow, due to excessive contraction of scar tissue.

Combined tonsillectomy and adenoidectomy, properly performed, means complete removal of all lymphoid tissue comprising Waldeyer's ring, a surgical perfection which, unfortunately, is far too often not obtained.

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## EXPERIENCES WITH WELL LEG TRACTION APPARATUS

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SINCE Anderson's beautifully conceived well leg traction apparatus appeared three years ago, there has been stimulated a great deal of interest and popularity in this method of applying traction throughout the country. New indications for its use have been gradually developed. The principle involved in the employing of the well leg for counter-traction, of course, was not new with Dr. Anderson and was used, probably, by various ingenious surgeons before Dr. Hoke first employed it twenty-odd years ago. I am not aware of any publication of his on the so-called "Hoke Plaster-Traction Apparatus," but his former associate, Dr. Lawson Thornton, discussed it in his brief "Bone and Joint Problems," published two years ago. My attention was called to the Anderson apparatus particularly at the Birmingham meeting of the Southern Medical Association over two years ago, when Dr. Bost, of Houston, Texas, gave us a report of its use in his hands.

A good many of us then felt that Dr. Bost was employing it in cases where it was not justified, but experience has subsequently shown that there are many more opportunities for its use than he mentioned. The one particular place which has been advocated, more so formerly than now, is in intracapsular fractures of the femur. While a good many men who treat fractures are of the opinion that it is indicated, the majority do not use it in this type of injury. I have used it unsuccessfully in two instances in intracapsular fractures of the neck of the femur, both practically hopeless cases, and I do not feel justified in coming to a definite conclusion. I do feel, however, that the maintenance of internal rotation of the femoral shaft is the chief reason for its use in treating fractures of the femoral neck, assuring as it does close apposition of the fragments. One must admit that the Anderson apparatus

From the Shriners' Hospital for Crippled Children.  
Read before the Sixth Annual Assembly of the Southeastern Surgical Congress in Jacksonville, March 11, 12 and 13, 1935.

does exactly this. The employment of any degree of maintained traction, however, I think is definitely contraindicated, and it is for that reason that I am not using it in these cases.

In the time at my disposal it is impossible for me to do anything more than mention briefly six conditions in which I have found this apparatus to be of particular value, and which I wish to emphasize.



FIG. 1

First: In scoliosis, where the primary curve is in the lumbar region, the control of the position of the pelvis in reference to the axis of the spine, is, of course, a difficult problem. It is of little value in the higher dorsal curves which unfortunately, are the more difficult to correct. In using this principle in controlling the pelvis, the awkward extension of the body cast to the knee in extreme abduction can be avoided. (Fig. 1)

The second indication for the use of well leg traction, which I do not think was advocated, at least originally by Dr. Anderson is dislocation of one innominate bone with or with-



out fracture. (Fig. 2) To date, I have not had an opportunity of trying this out, but in my last case of displacement of the entire innominate bone, where there was a complete separation of the symphysis in the vertical plane, with the usual displacement of the sacro-iliac joint, involving a fracture of the posterior superior spine, reduction was maintained on the table by two orderlies as long as one pushed up on the well side, and the other exerted traction on the dislocated side.



FIG. 2

The fracture was about a week old, and as soon as this traction was discontinued, the deformity immediately recurred. After the symphysis had been thoroughly exposed, a cross pin was used, passing it in the horizontal plane, through the body of the pubic bone, across the symphysis and through the body of the other pubic bone while proper apposition was maintained. It is felt that this position could have been gradually obtained and held easily with well leg traction without the necessity of doing an open reduction.

The third indication, proceeding distally, as it were, is the reduction of pathologically, or even traumatically dislocated hips. In the work at the Shriners' Hospital, one of the commonest serious problems that confronts us is the reduction of pathologically dislocated hips, the result of some condition which has seriously reduced the muscle tone in the vicinity

of the joint, such as local sepsis and infantile paralysis. We have found contracted cicatrices to be another cause of pathologic dislocation of the hip. I have not had occasion to use it in traumatic dislocation, as manipulative procedures have been successful. I have one case, however, where the superior margin of the acetabulum was fractured off and the well leg traction apparatus was most useful in maintaining the head of the femur and the broken off roof of the acetabu-

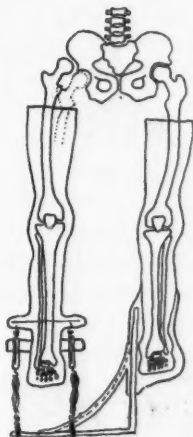


FIG. 3

lum in proper relation, pending union of the bone fragment. (Fig. 4.)

Another most important indication, the fourth in this series, for the use of this apparatus is in ankylosis of the hip in serious malposition, where, after osteotomy and myotomies, adequate correction cannot be obtained immediately. The slow, beautifully controlled abduction traction possible with well leg traction makes these ordinarily difficult problems relatively simple.

The care of intertrochanteric fractures is the fifth indication which I shall discuss in this brief report, and is the one which Anderson feels lends itself most advantageously to the well leg traction. In intertrochanteric fractures we tend frequently to discontinue our abduction traction too early because of the discomfort to the patient and necessary protracted hospitalization. I feel sure that in most instances it is quite

safe to allow these individuals to convalesce in their homes with the well leg traction on. (Fig. 4)

The sixth indication is fractures of the shaft of the femur. The tendency, of course, of all of these fractures, is to develop a lateral bowing for the same reason that a coxa vara develops in the intertrochanteric fracture, traction being removed too early.

When one has occasion to use a good many of the commercially manufactured Roger Anderson apparati, the surgeon,

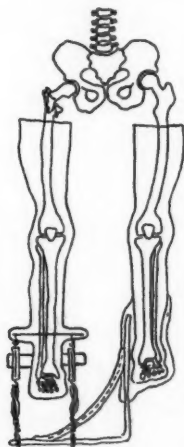


FIG. 4

or the hospital has more money tied up in them than is desirable. I have been forced to employ some less expensive device and have found that a simple large shelf bracket attached to the well leg cast, combined with an elastic element on the affected leg, is an effective substitute. The approximate cost of this is well under a dollar and compares very favorably, in my estimation, with the expensive commercial equipment.

My chief purpose in presenting this paper, is to emphasize a valuable principle which has not been looked upon with particular favor by some surgeons whose major interest is in the problems involving bone and joint surgery.

# THE DIAGNOSIS AND TREATMENT OF PRIMARY CARCINOMA OF THE LUNG

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THE incidence of primary carcinoma of the lung, or, more specifically, bronchiogenic carcinoma, seems to be increasing, but Fried<sup>1</sup>, after a careful study of the subject, concludes that the increase is more apparent than real. He believes that the chief factor in this apparent increase is more accurate diagnosis, both clinical and pathologic. One can easily understand an increase in the number of cases diagnosed clinically, for the development of such diagnostic aids as roentgenology, bronchography, and bronchoscopy has greatly facilitated the ease and certainty with which such diagnoses are made. There is no obvious reason, however, why there should be such a marked increase, both relative and actual, in the number of cases diagnosed at autopsy as bronchiogenic carcinoma. Whatever the explanation may be, a renewed interest in this form of cancer is evidenced by the discussions which have appeared in the literature during the past few years. The increased interest may be at least in part the result of the rapid development of radiation therapy and thoracic surgery, both of which offer some hope of relief from a disease which was previously regarded as almost entirely hopeless.

## DIAGNOSIS

The diagnosis of bronchiogenic carcinoma is still infrequently made early, and this is unfortunate, for it is only in this stage that any form of therapy offers an appreciable chance of cure. The infrequency of early diagnosis may be explained in a number of ways. Physicians often do not consider carcinoma until all other pulmonary conditions have been eliminated, either by careful study or, much too frequently, by time. When they do consider carcinoma as the possible cause of the pulmonary symptoms, they are apt to

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think of symptoms and signs which make their appearance late in the disease, as for example, hoarseness, cyanosis or blood-tinged pleural fluid. It is deplorable that many textbooks and even some recent articles still stress these late symptoms and signs. In this paper, I am purposely avoiding a discussion of those symptoms which usually are not present until the disease has reached a hopelessly advanced stage.

Early carcinoma of the lung does not give rise to any characteristic findings either in the history or on physical examination, but there are certain suggestive symptoms and signs which should demand prompt and careful investigation, if a diagnosis during the curable stage is to be made. Those which are apt to occur early are cough, sputum, hemoptysis and pain. Since these tumors usually, if not always, start in the bronchi, and most frequently in the larger bronchi, cough makes its appearance early in the disease. The cough is often non-productive at first, but when ulceration occurs mucoid sputum often blood-streaked will be raised. Hemoptysis is common and may be one of the earliest signs. Usually only a small amount of blood is expectorated, but occasionally a large hemorrhage occurs. Pain occurs more frequently than would be expected and cannot always be explained: in the majority of cases it is probably the result of pleural involvement, not by invasion of the tumor, but by inflammation secondary to atelectasis of that portion of the lung supplied by the affected bronchus. Occasionally the pain is due to obstructive emphysema: in such instances there may be an associated dyspnea. The caliber of the bronchi is not great, so either emphysema or atelectasis, usually the latter, may appear relatively early. Occasionally atelectasis will appear in one portion of a lung and emphysema in another, as, for example, when a tumor occurs at the bifurcation of a bronchus, completely occluding one branch and partially occluding the other.

#### PHYSICAL SIGNS

Most bronchiogenic carcinomas arise in the larger bronchi, which are well covered by lung tissue, and are therefore not demonstrable by physical examination until the bronchial lumen is partially or completely obstructed, when the signs of obstructive emphysema or atelectasis may be demonstrated.



A few of the bulky, circumscribed, peripheral tumors will present as localized areas of dulness.

#### OTHER AIDS TO DIAGNOSIS

X-ray examination is invaluable in the diagnosis of this disease. Peripheral tumors frequently give rise to a well localized, dense x-ray shadow which is strongly suggestive if not absolutely characteristic. Tumors of the larger bronchi give rise to less characteristic shadows and these may be overlooked until bronchial obstruction produces atelectasis. Any patient with recurrent or persistent atelectasis should be suspected of an intrabronchial tumor.

Bronchography is valuable especially when obstruction is present, as it not only shows its presence but also accurately localizes it; but even when obstruction is not present, a carefully done bronchogram may show an area of imperfect filling.

Bronchoscopy with the removal of a piece of tissue for microscopic examination is the only method by which a positive diagnosis of bronchial carcinoma can be made other than by thoracotomy. It is not always possible to obtain a piece of the tumor tissue, especially when the tumor is peripheral. Jackson<sup>2</sup> estimates that a positive biopsy should be obtained by bronchoscopy in 75 per cent of cases of bronchiogenic cancer, but this figure seems high. However, bronchoscopy should be carried out in any case suspected of having such a tumor, as the findings are of value even when a piece of tissue cannot be obtained.

When a positive diagnosis cannot be made by other means, thoracotomy should be advised. If the parenchyma of the lung is involved, a specimen can be removed for microscopic examination; and, if the tumor is still confined to a larger bronchus, the posterior surface of the bronchus may be incised and the tumor removed for study.

#### TREATMENT

Kernan<sup>3</sup> and others have recommended the treatment of bronchial cancer through the bronchoscope by fulguration, application of radium, etc. It would seem that fulguration

alone should be used only as a palliative measure to relieve bronchial obstruction in those cases not suitable for other forms of therapy which might offer some hope of cure. The intrabronchial application of radium alone or combined with deep x-ray therapy would seem to offer some hope, but the results have, so far, been disappointing. Edwards<sup>4</sup> reported thirty-two cases in which intrabronchial radiation had been applied by his very ingenious method, but of these only one patient survived for more than three years. Deep x-ray therapy alone has been consistently disappointing in definitely proven cases of bronchial cancer and should therefore be reserved for cases not suitable for radical treatment.

#### SURGERY

While numerous palliative surgical procedures have been carried out in bronchial cancer for a number of years, attempts at radical surgical removal of such tumors were infrequent until a few years ago. These consisted of either partial or complete lobectomy until 1933, when Graham<sup>5</sup> reported the first successful total pneumonectomy for bronchial carcinoma. Since then there have been reports of other successful cases by Churchill<sup>6</sup>, Rienhoff<sup>7</sup> and Overholt.<sup>8</sup>

Graham has suggested that total pneumonectomy may be the operation of choice in bronchial carcinoma, and it may be that it will offer sufficient chances for cure to justify its use even when the entire local growth might be removed by lobectomy. Complete pneumonectomy is not technically more difficult than lobectomy, but one may expect both the mortality and morbidity rates to be higher following the more radical procedure, especially in older individuals in whom a greater burden is thrown upon the circulatory apparatus. However, the experimental work of Moore and his associates<sup>9</sup> has shown that there is no decrease in the cardiac output in normal animals following ligation of either pulmonary artery. The work of Tuttle and Womack<sup>10</sup> indicates that patients with tumor so located as to require pneumonectomy have a greater chance of permanent cure than those in whom the tumors are more peripheral. This should be taken into consideration in making any statistical study of the relative percentage of cures by the two procedures. It would seem for the present that lobectomy

should be done if the tumor is so located that it can be completely removed in this way. If the tumor is located so near the hilus that it cannot be removed satisfactorily by lobectomy, pneumonectomy should, of course, be done.

### TECHNIC

Since lobectomy is now a rather well standardized procedure, its technic will not be described; but the technic for complete pneumonectomy is still open for discussion. It would seem that the anterior approach recommended by Rienhoff<sup>7</sup> and Overholt<sup>8</sup> would be better in most cases, especially when the tumor is on the left side. However, if there are extensive adhesions (as shown by air injection), the long intercostal incision used for other intrathoracic procedures will probably prove more satisfactory. The operation is usually carried out in one stage, following collapse of the lung by artificial pneumothorax, and, if there is little pulmonary infection, the chest may be closed without drainage. If there is extensive infection in the lung, preliminary ligation of the pulmonary artery and removal of enlarged mediastinal lymphatic glands might prove to be of value, for the chances of serious infection should be decreased by doing most of the mediastinal manipulation before opening the bronchus.

### RESULTS

There has so far been little opportunity for comparing the results obtained by radical excision of the diseased lobe or lung with other forms of treatment, but excision of the tumor would seem desirable when possible. Gratifying surgical results have been obtained by Sauerbruch<sup>11</sup>, Graham<sup>5</sup>, Edwards<sup>4</sup>, Allen and Smith<sup>12</sup>, Young<sup>13</sup>, Rienhoff<sup>7</sup>, Churchill<sup>6</sup> and others.

### CASE REPORTS

CASE I. A 14-year-old white boy was admitted to the Memorial Hospital on July 3, 1931, complaining of pain in the left side of the chest, cough, and fever. A few days before Christmas, 1930, he had a respiratory infection with pain in the back and shoulders, and a diagnosis of influenza was made. A few days later he developed a cough which was productive of a moderate amount of thick, tenacious sputum. The cough and pain in the left side of the chest had persisted up until the time of his admission. On two occasions

he had expectorated small quantities of blood. There had also been a slight continuous elevation of temperature.

The left side of the chest showed marked limitation of motion and retraction. There was dullness on percussion, diminution of tactile fremitus over the lower portion of the left lung, and an absence of breath sounds over the same area. No adventitious sounds were heard. These findings were thought to indicate an atelectasis of the left lower lobe. There were no abnormal findings over the right side of the chest.

X-ray examination showed thickening of the pleura over the lower portion of the left chest and obliteration of the left costophrenic angle, mottling of the lower portion of the left lower lobe, and a marked enlargement of the

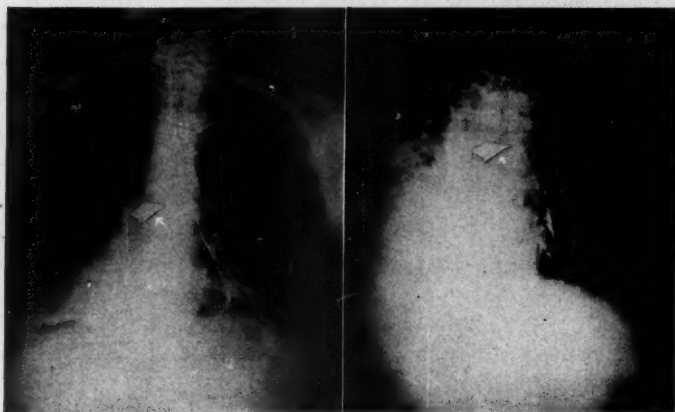


FIG. 1. Bronchogram in Case 1 made on July 17, 1931, showing complete occlusion of left lower lobe bronchus.

FIG. 2. Bronchogram in Case 1 made on February 13, 1932, showing complete occlusion of left lower lobe bronchus, a dense shadow involving the lower portion of the left lung, and mottling of the upper portion of the left lung.

hilus shadow. The upper portion of the left lung and the entire right lung were clear. X-ray examination following the injection of iodized oil showed an obstruction in the left main bronchus about 6 cm. from the bifurcation of the trachea.

Bronchoscopic examination was made by Dr. E. U. Wallerstein on July 21, 1931, and a narrowing of the left main bronchus observed but tissue was not obtained for microscopic examination.

The diagnosis being indeterminate, the patient was discharged from the hospital on Aug. 8, 1931, with the advice that he return in two or three months for observation. He did not return until Feb. 9, 1932: at that time both physical and x-ray examinations indicated an atelectasis involving practically the entire left lung. The lower portion was opaque, while the upper portion showed considerable mottling. The right lung was still clear. A bronchogram on February 13 again showed a complete obstruction of the left

main bronchus. Bronchoscopy was done by Dr. Wallerstein on the 18th, and a well defined tumor visualized in the left main bronchus a short distance below the bifurcation of the trachea. A piece of tissue removed for microscopic examination showed fragments of muscle, and connective tissue, and a small clump of squamous epithelial cells: it was reported as inadequate for diagnosis.

Exploratory thoracotomy was decided upon with the idea of removing the tumor if possible. As a preliminary measure, 60 c. c. of air was injected into the left pleural cavity on February 23. Previous to this air injection, the patient had been running a low grade fever with an occasional sharp rise, but following the air injection there was a sharp, persistent rise in temperature, which ranged from about 100° to 102°.

X-ray examination following the air injection showed a considerable degree of collapse of the left lung with a dense adhesion at the level of the seventh interspace in the axillary line and adhesions between the base of the lung and the diaphragm. Another x-ray examination three days later showed a collection of fluid in the left pleural cavity and an almost complete collapse of the lung.

Four days following the air injection a small amount of thick odorless purulent fluid was aspirated from the pleural cavity. It was evident that the lung had been torn, probably by one of the adhesions, with resulting infection of the pleura. Obviously this was a serious complication: if the empyema were first drained and the cavity allowed to become obliterated, it would make operation upon the lung extremely difficult: since it was suspected that the tumor was malignant it was decided to proceed with the thoracotomy.

Operation was carried out on March 1, 1932, under nitrous oxide-oxygen anesthesia. The left pleural cavity was entered through a long intercostal incision in the seventh interspace. The sixth, seventh, and eighth ribs were divided posteriorly, the pleura incised, and the pleural cavity opened widely by a rib retractor. It contained a large amount of fibrin and some pus. Numerous dense adhesions posteriorly and at the diaphragm were separated with some difficulty. The posterior surface of the left main bronchus was exposed, an incision made just proximal to its bifurcation, and a well circumscribed tumor, completely filling the lumen, was removed. Since the tumor appeared benign, the wound in the bronchus was closed. A stab wound was made in the tenth intercostal space in the scapular line, a rubber tube inserted, and closed drainage instituted. Following operation the patient was given a transfusion.

Dr. Lewis C. Pusch made a pathologic diagnosis of basal-cell bronchiogenic carcinoma of a moderate degree of malignancy.

Since there were no signs of metastasis to the mediastinum or elsewhere, it was decided to perform total pneumonectomy. On March 8, the incision was opened under nitrous oxide-oxygen anesthesia, and the pulmonary artery exposed and ligated. An attempt was made to tie the ligature tight enough to occlude the vessel but not so tight as to injure the intima seriously. It was tied in the form of a loop knot and the ends of the ligature left long and brought out at the posterior end of the wound, which was closed with interrupted sutures.



At the beginning of this operation the blood pressure was 110 systolic and 80 diastolic and at the completion it was 120 systolic and 80 diastolic. The pulse rate was 120. Five hours after operation the blood pressure dropped to 100 systolic and 60 diastolic, then promptly rose to 110 systolic and 70 diastolic and then to 120 systolic and 60 diastolic and remained at this level.

On March 11, three days after ligation of the pulmonary artery, the wound was reopened under nitrous oxide-oxygen anesthesia, and the entire left lung excised. The bronchial stump was closed with interrupted sutures of chromic catgut and the pulmonary vessels ligated individually.

At the beginning of the operation the blood pressure was 120 systolic and

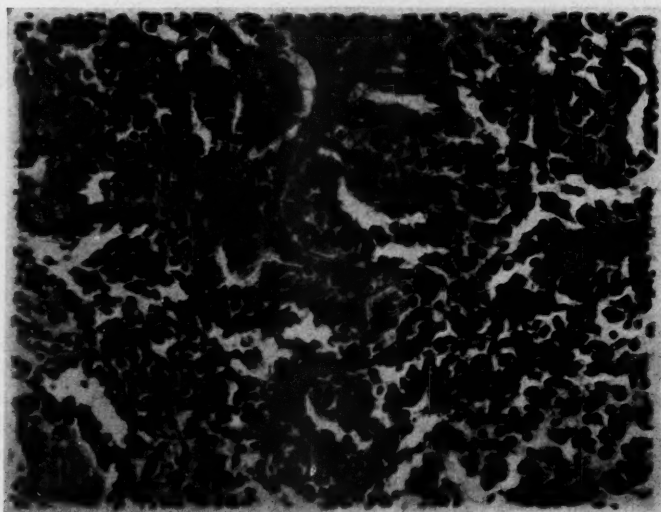


FIG. 3. Microphotograph of tumor removed from left main bronchus in Case 1.

80 diastolic. The patient stood the operation well and at its conclusion the blood pressure was 110 systolic and 80 diastolic. The systolic pressure promptly rose to 120 and the diastolic dropped to 60, and both remained at approximately these levels. Respiration at the beginning was 22 and at the conclusion 24, and the pulse rate increased from 116 to 142.

The pathologic report of Dr. Lewis C. Pusch was as follows:

Gross Description: Dimensions of the lung are 20 by 13 by 5 cm., its weight (received incised) 610 Gm. The pleural surface everywhere is covered with stubs of dense fibrous and fibrinopurulent adhesions, with which small masses of yellow purulent and necrotic debris are associated. At three points, involving chiefly the base of the lung, the surface is broken, revealing ragged, hemorrhagic, and necrotic walls of cavities, varying from 3 to 6.5 cm. in length. Except for these cavities the lung substance is consolidated, without the usual gross features of atelectasis, and has an unusual mottled, yellowish-white, red and brown, moist, glazed cut surface, with conspicuous



perivascular and peribronchial fibrous strands ramifying throughout its substance. On compression of lung substance exudate, transudate, or air does not escape from its cut surface. The lymph glands at the hilus are enlarged, anthracotic, and edematous. Limited dissection of bronchial tubes and blood vessels reveals lumens devoid of contents, with linings smooth and pink. Some of the smaller veins were filled with coagulated blood.

**Microscopic Descriptions:** In one section from the hilus, near the wall of a bronchus intralymphatic (vascular), intrabronchiolar, and intra-alveolar groups of hyperchromatic and pleomorphic epithelial cells, identical with those portions of the bronchial tumor removed on March 1, are observed . . . Neoplastic involvement of bronchial walls at hilus is not observed. . . .

**Pathologic Diagnosis:** Intrapulmonary extensions and metastases of basal-cell bronchiogenic carcinoma. Chronic bronchitis; bronchiectasis; bronchiectatic abscesses. Chronic interstitial pneumonia. Multiple hemorrhagic infarcts. Partial atelectasis. Subacute fibrinopurulent pleuritis. Chronic lymphadenitis with ischemic necroses.

Three days after excision of the lung he developed a pericardial friction rub which persisted for several days, but x-ray examination at this time did not show an appreciable enlargement of the pericardial shadow. However, an x-ray plate made fourteen days later, showed it greatly enlarged. On the following day 500 c. c. of light yellowish purulent fluid was aspirated from the pericardial cavity, and drainage, under local anesthesia, on the 30th, nineteen days after excision of the lung, was followed by prompt and decided improvement. His temperature, which had been elevated, gradually came to normal, but his rapid pulse rate continued. Ten days later some edema of the ankles, then of the legs, thighs, and scrotum developed. Two weeks after the operation and four days after the edema was first noticed, it became marked and involved the lower abdominal wall. Ascites and enlargement of the liver also developed. The pulse rate increased and the volume was not good. There was marked thickening of the parietal pericardium, suggesting an accumulation of pus in the posterior portion of the pericardial sac, so on April 15, sixteen days after drainage of the pericardial cavity, the original incision was extended up to the lower border of the second costal cartilage and the third and fourth cartilages resected (the fifth and sixth cartilages had been resected at the time of the pericardiostomy). A portion of the left border of the sternum was also excised, exposing part of the anterior wall of the pericardium, which was excised and found to be greatly thickened. The posterior portion of the pericardial space was explored but no pus found. It was thought that excision of the thickened pericardium might relieve the circulatory embarrassment, but the patient became progressively worse and died April 21, 1932, forty-one days after excision of the lung.

Autopsy revealed septic hemorrhagic infarcts and broncho-pneumonia in the right lung. There was a dense fibrinopurulent pericardial exudate, partly organized, which was constricting the great veins within the pericardium. One mediastinal lymph gland showed a few small metastatic groups of columnar epithelial cells.

## COMMENT

There are several points of unusual interest in this case:

This 14-year-old boy was the youngest of sixty-four cases of carcinoma of the lung recorded with the Chest Tumor Registry.

The tumor, according to the history, had probably been present for more than a year and yet there was only one small area of metastasis in the regional lymph nodes and no distant metastases. This finding is in accord with the ideas expressed

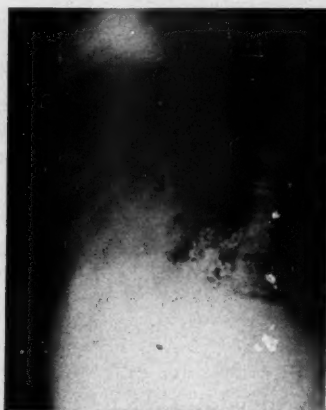


FIG. 4. Bronchogram, lateral view, in Case 2, showing filling of the proximal segment of the lower lobe bronchus.

by Tuttle and Womack<sup>10</sup> in regard to the relationship between the location of the tumor and the prognosis.

The development of obstruction in the great veins is an unusual sequel to suppurative pericarditis.

The pulmonary artery was ligated as a preliminary procedure because it was thought that if signs of circulatory failure developed within a short time the ligature could be released and the pulmonary circulation re-established. This was unnecessary, and it has since been shown both experimentally and clinically that there is no reason especially to fear serious circulatory disturbances following ligation of either pulmonary artery. However, it would seem wise in certain cases with considerable intrapulmonary infection to

do a preliminary ligation of the artery and at the same time a dissection of the mediastinal glands.

**CASE 2.** A white man, 52 years of age, was first seen July 13, 1934, complaining of a pain in the left side of the chest, a dry cough, and fever. In April, 1934, a diagnosis of pneumonia had been made on account of productive cough, and fever had persisted. On two occasions he had expectorated blood-tinged sputum. He had lost about twenty pounds.

Breath sounds were absent over the anterior and lower portion of the left chest. Dulness to percussion and marked diminution of tactile fremitus were noted over the same area. Total leukocyte count was 21,200, with 88 per cent neutrophils. An x-ray examination on July 11, five days earlier, had shown elevation of the left diaphragm and increased density at the left base. A lateral plate had not been made.

On July 17 a bronchogram showed satisfactory filling of the posterior division of the left descending bronchus. The anterior division was filled for a distance of about 1 cm. but there was no filling beyond that point. After coughing a second plate still showed the proximal portion of the anterior division of the descending bronchus filled with lipiodol. This confirmed the diagnosis of complete obstruction of this division of the bronchus. The obstruction was thought due to a tumor.

At bronchoscopic examination by Dr. Wallerstein on July 24 thick, mucopurulent material was seen coming from the anterior division of the lower lobe bronchus but no definite obstruction could be visualized. Following aspiration of this mucus the patient stated that he felt much better. After three weeks another lipiodol injection was done (August 13) with the same findings. Three days later bronchoscopy revealed a small tumor obstructing the anterior division of the lower lobe bronchus, but a piece of tissue removed for microscopic examination was reported as showing essentially normal fragments of bronchial wall. In spite of the negative biopsy, it was felt that the patient had a bronchiogenic carcinoma, so exploratory thoracotomy was advised.

Preliminary to the thoracotomy an attempt was made to collapse the lung by the injection of air into the pleural cavity, but it was found that the two layers of pleura were adherent over the entire lower lobe and over the greater portion of the upper lobe. He was admitted to the hospital on Sept. 5, 1934, and operated upon on the following day.

Under intratracheal nitrous oxide-oxygen and ether anesthesia, a long intercostal incision was made in the fifth intercostal space, extending from the angle of the ribs posteriorly to the anterior axillary line. The fifth and sixth ribs were divided posteriorly, the pleura incised, and the lung separated from the pleura a short distance on either side of the incision. A rib retractor was inserted and the pleura opened widely. The pleural cavity was completely obliterated over the lower lobe and the posterior and lateral surfaces of the upper lobe. The lower lobe was separated from the parietal pleura and diaphragm with some difficulty, as in certain places, particularly over the anterior portion of the diaphragm, the adhesions were very dense. After the lower lobe had been freed, a firm mass could be felt in the anterior and lower portion of the lobe near the hilus. That portion of the lung distal

to this mass was completely atelectatic. The mass was so firm it was thought that it was almost certainly carcinoma, and since the lobes were completely separate, making it possible to remove the entire lower lobe, it was decided to proceed without a biopsy. A tourniquet was applied to the pedicle just distal to the upper lobe bronchus and another tourniquet applied about one inch distal to this and the upper and lower borders of the pedicle grasped by clamps immediately distal to the proximal tourniquet. The pedicle was then divided and the bronchial stump treated with Carnoy's solution and closed by mattress sutures of chromic catgut. The pulmonary vessels were then occluded by ligatures of chromic catgut and a very small amount



FIG. 5. Lower lobe of left lung in Case 2, showing atelectasis (dark area) of that portion of the lung supplied by the occluded bronchus.

of lung tissue which had been left attached to the stump of the bronchus was closed over it with interrupted sutures of chromic catgut. A 20 French catheter was inserted through a trocar wound in the ninth interspace posteriorly and the incision closed in layers with interrupted sutures. The blood pressure at the beginning of the operation was 120 systolic and 70 diastolic. It dropped to 100 systolic and remained between 100 and 110 systolic until about the time the lobe was excised, when it dropped to 90 systolic. Immediately after the operation the patient was given a transfusion.

The pathologic report by Dr. Lewis C. Pusch was as follows:

Gross Description: A mass of irregular pyramidal shape, 3.5 cm. long, and 2 cm. in diameter at its base, lies at the hilus of the lung. The axis of the mass coincides with that of the main bronchus of the lower lobe; it completely surrounds this bronchus.

**Microscopic Description:** The mass associated with the bronchus and replacing pulmonary substance is composed of bulky groups of anaplastic epidermoid epithelial cells with supportive fibrous stroma. Many cells have the so-called "oat-cell" morphology, many are small and of the basal-cell type, while others are more definitely but atypically squamous. Bronchial cartilages are completely surrounded by such neoplastic masses. . . . A peribronchial lymph node presents metastatic carcinoma, healed tuberculous foci, and anthracosis.

**Pathologic Diagnosis:** Squamous cell bronchiogenic carcinoma, of moderately high degree of malignancy, with metastases to peribronchial lymph

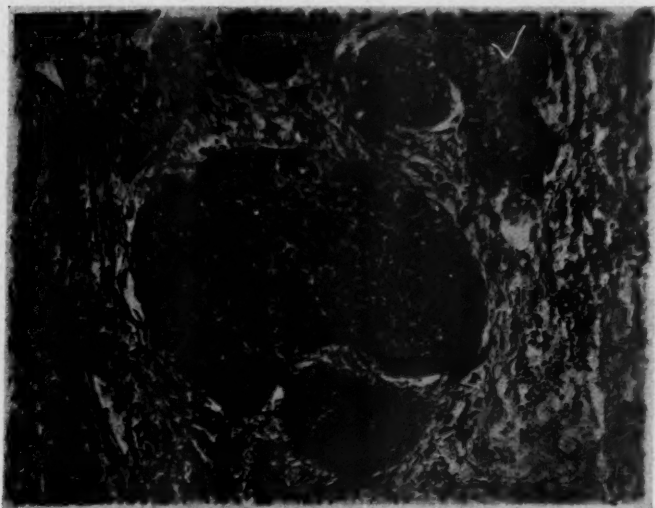


FIG. 6. Microphotograph of section of tumor in Case 2.

nodes. Subacute interstitial pneumonia. Partial atelectasis. Inactive tuberculous foci in peribronchial lymph nodes.

On his return to his room the systolic blood pressure was 105 and five hours later it had risen to 120 and remained approximately at that level. Convalescence was almost uneventful. His temperature ranged from 100° to 101° for ten days, then gradually came to normal, and remained practically so. For the first few days after operation much blood-tinged serum, drained through the catheter, later became purulent, and he continued to drain a moderate amount of thin pus until Oct. 17, 1934, when the left phrenic nerve was crushed. Following this, the drainage rapidly decreased and within a few days the tube was removed and the drainage tract promptly closed.

The patient's general condition has constantly improved and he has regained his normal weight. When last examined on Sept. 2, 1935, a year after operation, he showed no evidence of recurrence and was in excellent general condition.



## COMMENT

The question as to whether lobectomy or pneumonectomy should have been done in this case is relevant. Since the lobes were completely divided, it was possible to remove the entire tumor by lobectomy, and at the same time two enlarged lymph glands near the hilus of the lung. These glands showed metastatic tumor cells.

This man had an uneventful convalescence and now has a considerable amount of functioning lung tissue on the left side. It would seem that lobectomy should be the procedure of choice in such a case unless it can be shown that the chances



FIG. 7. Roentgenogram of chest in Case 2 made on March 4, 1935, six months after operation, showing marked elevation of left diaphragm.

of permanent cure are definitely increased by total pneumonectomy.

## SUMMARY

The early diagnosis of carcinoma of the lung is difficult, as there are no pathognomonic signs or symptoms; but cough, productive of mucoid or blood-tinged sputum which does not contain tubercle bacilli, should be considered suggestive of this disease. Pain in the chest, especially when associated with recurrent or persistent atelectasis, is also significant. Patients presenting such symptoms should certainly be thoroughly investigated, for only in this way will an appreciable percentage



of cases of cancer of the lung be diagnosed before the disease has become hopelessly advanced.

The last word has not been said in regard to the treatment of this disease, but since radiation, both by radium and x-ray, has proven ineffectual, it would seem that patients diagnosed sufficiently early should be given the benefit of the doubt and an attempt made to excise the diseased lung tissue.

Two such cases treated surgically are reported. In the first it was unfortunately necessary to do a total pneumonectomy in the presence of extensive pleural infection, and this was followed by a suppurative pericarditis which eventually caused death. In the second it was possible to remove the entire local growth by lobectomy, but two enlarged hilus glands removed with the lobe showed small groups of metastatic carcinoma cells. No other suspicious glands were discovered and there has so far been no evidence of recurrence.

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## THYROID DISEASE IN THE NEGRO

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**W**E are all familiar with the popular conception that thyroid disease is relatively rare in the negro race.

Robert McCarrison in his monograph states: "All races of mankind suffer from goitre: there appears to be no such thing as race immunity to the disease."

Professor Matas, to whom belongs the honor of having been the first to operate for thyroid disease in New Orleans (Oct. 11, 1888), stated in his thesis before the American Surgical Association in 1896, "That absolutely specific diseases, ethnically speaking, have ceased to exist in the American negro of today; that absolute immunity from certain diseases does not exist; and that he differs from the white man simply in the relative predisposition to, or immunity from, the various diseases that prevail in this country. It is thus demonstrated that the fundamental nature is the same in both races, and that a study of the differences must be based upon the action of the common factors of disease upon the acquired constitution of the negro which, in America, must be regarded as the sum of his original race distinction, plus the modifications due to a new environment and a fierce struggle for survival."

In spite of these pronouncements from masters the surgical experience of the majority of the profession with thyroid disease in the negro was so small that the conclusion that the negro was "relatively immune" (Bramn) persisted in finding its way in the literature.

Within recent years observers throughout the country have been recording increasing numbers of thyroid disease in the negro.

Jones, of Atlanta, reported "Eighteen negroes with goiter out of a total of 407 patients from his private practice in Georgia."

Harris, of Shreveport, stated that "during the year 1926 there were admitted to the Shreveport Hospital 5,583 patients

of whom 6 were cases of goiter. Five negro females and 1 negro male. In the year 1927, a total of 7,467 patients were admitted and of this number 19 had goiter—12 negro females."

Herrmann, of Cleveland, in 1932 stated: "A review of the patients admitted to the Lakeside Hospital because of goiter has shown a relatively large number of negroes with a severe form of that disease syndrome. During the five years between July, 1924, and July, 1929, there were 7,421 patients admitted to the Surgical Service of the Lakeside Hospital. Of these patients, 729 had goiter. Of the 358 patients with exophthalmic goiter, there were 325 white people and 33 negroes. Five negro females and one negro male had toxic-non-exophthalmic goiter. Of a total of 571 patients with thyrotoxicosis, there were 40 negroes." He concluded that "Thyrotoxicosis is not an uncommon disease in the negro, and that all varieties of the symptom complex have been observed in the negro."

In 1934 Maes, of New Orleans, reviewed the cases admitted to Charity Hospital for seven years ending in 1933. From his paper I quote the following: "We were able to find in Charity Hospital, in which institution the yearly admissions during the same period have averaged about 40,000, only 341 surgical cases of all varieties of the disease. One hundred and forty-eight of them were in the negro and 73 were of the toxic variety, with the nodular form rather the more frequent."

Since this report by Maes I have had occasion in my service at Charity Hospital to observe more than 40 thyroid cases. Of this number 26 have been operated. At times there are as many as three or four cases in the ward. Many of the patients are not operated upon because the proportion of deseriptions among them is very high. At least 8 of the 40 recorded have deserted.

A few years ago thyroid disease in any strata of our Southern population, more particularly in Louisiana, was rare. At the present time we are seeing a comparatively large number of thyroids in this service of nineteen "colored beds." The cases seen belong to almost every type of thyroid disease described. During the past two years there have been cases of acute suppurative thyroiditis, adolescent goiter, nodular toxic and nodular non-toxic goiters, diffuse non-toxic and diffuse

toxic goiter as well as malignant diseases of the thyroid. The cases have been almost equally distributed between nodular toxic and nodular non-toxic goiters. A few cases of true exophthalmic goiter have been operated upon in the service.

It is a surprising fact to me that thyroid disease is not more frequent among the negroes because cabbage is one of the staple articles of diet among them. Chesney and Webster have shown that prolonged feeding of cabbage causes thyroid hyperplasia in rabbits.

David Marine in seeking the cause for this found that mustard oils (isothiocyanates) are the most characteristic constituents of the cabbage group. He found that thyroid hyperplasia may be produced in rabbits by all cyanides contained in the foods which were tested. Marine and his associates also found that iodine administration will prevent hyperplasia of the thyroid caused by cyanides. One of their conclusions was that if cyanides proved to be an essential factor both exogenous and endogenous sources of cyanide should be sought.

It should be a fruitful source of clinical experimentation to determine the possible part played by food stuffs in the development of thyroid hyperplasia, particularly as we seem to be noting an increase in the incidence of thyroid disease in the negro population.

In view of the fact that experience in certain sections of the country has been comparatively limited in the management of thyroid disease it is not out of place to state that the morbidity and mortality in operative procedures in thyroid disease will diminish in proportion to the attention to details of management on the part of the surgeon and his associates.

The routine examination in our cases has included, in addition to the physical examination, metabolism readings at intervals during a period of rest and iodine therapy; x-ray studies of the neck and chest; electrocardiograms and a laryngoscopic examination. This routine is not merely done as a means of compiling scientific data, but for the future safe handling of the case.

Let us admit that the metabolism reading is not an absolute test, but it is an additional guide in arriving at the time of optimal safety in operating. It also serves as an indicator

for the need of preoperative iodine medication. The usefulness of iodine in the preparation for operation cannot be exaggerated. Iodine, either in the form of Lugol's solution, sodium iodide intravenously or iodostarine by mouth, given over a period of ten days reduced the metabolism in most cases to a safe level.

There is one controversial point in reference to the administration of iodine. Goetch and many others state that iodine is unnecessary in nodular toxic goiter, the so-called toxic adenoma. On this point it is my practice to give Lugol's solution to these patients because it is my belief that the same substance is responsible for the stimulation of the sympathetic system in all types of toxic goiter, and it is certain that the regressive changes produced by iodine are the same in all forms of thyroid hyperplasia. It should be emphasized that iodine should not be given over long periods of time, and under no circumstances should it be considered except as a means of preparation for operation.

One last word about iodine in thyroid disease: a certain number of patients are unable to retain Lugol's solution by mouth, and a few are delirious. These patients can be stabilized best by the administration of sodium iodide intravenously, in doses of  $7\frac{1}{2}$  to 15 grains, once daily for several days.

The metabolism readings in nodular toxic goiter have been on an average almost as high as the reading in exophthalmic or true diffuse hyperplastic goiter. In one instance of nodular goiter the reading has been as high as 90.

X-ray studies of the neck and chest have been made in each case. The chief bits of information gained in this way have been the presence of substernal enlargement, deviation of the trachea and cardiac hypertrophy. The knowledge of the presence of a substernal goiter is of great importance before operation, especially if the goiter has existed for a long period. If a substernal enlargement has existed for a long time there is one thing which should be known and that is the amount of deviation of the trachea. It is well to remember that substernal enlargements usually result from a nodular goiter (adenoma of the lower pole of one lobe). The deviation of the trachea will be to the opposite side. Furthermore if a



goiter has been present for sometime it is possible that absorption of tracheal rings may have taken place. If these facts are not accounted for beforehand great distress may be experienced at the operating table, such as sudden release of the firm hold which the thyroid tumor had on the trachea may allow a sudden collapse of the trachea and a consequent asphyxial death. Precautions to avoid this calamity should be taken preoperatively.

The proportionately large number of substernal goiters has been surprising. The number of cases in which the x-ray has revealed calcification within the thyroid has been a matter worthy of note. The tracheal deviation has been seen sufficiently often to make us utilize intratracheal anesthesia routinely when there is evidence beforehand of its presence, and when a substernal goiter exists.

The value of an intratracheal anesthesia can hardly be overestimated for two reasons, first, there is no danger of tracheal collapse, and, secondly, there is no respiratory distress experienced during the procedure. The pressure of and the pull on the thyroid tumor does not interfere with free inspiration and expiration through the intratracheal air way.

Electrocardiographic examinations have been consistently negative in the non-toxic nodular goiters, occasionally positive in the nodular toxic types and frequently positive in the true hyperplastic diffuse or exophthalmic goiter. This is not different in any respect from the findings in other races.

In all cases which have come under our observation the precaution has been taken to have a laryngoscopic examination prior to operation to determine the condition of the vocal cords. Pressure on a recurrent laryngeal nerve may have caused a paralysis of one of the vocal cords. Failure to obtain this information preoperatively may cause embarrassment and necessitate needless postoperative explanations.

To obtain the above data requires no extra time, as it can be done while the patient is being prepared for operation. Every safeguard thrown around the patient before operation combined with an anatomic operation which is gently and expeditiously done diminished the postoperative worries.

The postoperative treatment as observed in our service consists in the maintenance of the fluid balance (with intravenous



drip and fluid by mouth as soon as the patient can take it without vomiting), morphine in adequate amounts to favor rest and diminish psychic disturbances, as well as Lugol's solution, during the first forty-eight hours at least, by rectum.

#### SUMMARY

1. Thyroid disease is not as rare as it is supposed to be among the negro race.
2. In less than two years forty or more cases have been admitted in one colored female surgical service at Charity Hospital in New Orleans.
3. Twenty-six cases have been operated on, eight have deserted and six transferred to other services because of conditions more pressing than the non-toxic thyroid.
4. The cases have been almost equally distributed between the toxic nodular and non-toxic nodular goiter.
5. Exophthalmic goiters are included in this series.
6. All varieties of disease of the thyroid including acute suppurative thyroiditis have been seen.
7. A number of substernal goiters are included in this series.
8. A few long standing cases have shown areas of calcification within the thyroid masses.
9. In all cases routine examinations have included x-ray of the chest, laryngoscopic examination, electrocardiographic examination as well as metabolism tests.
10. In the negro race the clinical findings have in no way differed from those in the white race.
11. All of the nodular toxic and exophthalmic cases have responded well to iodine therapy preoperatively.

## ACUTE APPENDICITIS AT THE EXTREMES OF LIFE

Based on an Analysis of 426 Cases in Children under 12 and 224 Cases  
in Adults over 40 years of age

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*with*

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**I**T IS no exaggeration to say that any statement which can be made about acute appendicitis in general can be made with double force about acute appendicitis at the extremes of life. A dangerous and treacherous disease at any age, it is doubly treacherous in those years, when its manifestations are less clear-cut, though infinitely more devastating, its diagnosis is more difficult, and its victims, because of their youth on the one hand and their age on the other, are less fitted to withstand the ravages of any disease.

In this communication, the seventh of a series dealing with various phases of acute appendicitis, the number of cases studied from the records of the New Orleans Charity Hospital has been increased to 2,295 and the 5-year period in which they occurred has been brought up to April 1, 1935. It should be emphasized, in the beginning, that all of the cases studied are really cases of acute appendicitis. We feel very strongly that reports which include the chronic and recurrent variety, as well as reports which include only the complicated variety, give an equally unfair picture of the situation. There is nothing to be proud of in any event, but surely the surgeon who has sufficient wisdom to remove the simple acute appendix while it is still simple has acquired merit, and surely such cases form an integral part of any analysis, though just as surely cases of recurrent or chronic appendicitis do not.

On the other hand, we viewed with wholesome respect the cases filed as acute which we discarded because they were not really acute. They were unnecessary emergencies, it is true,

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and perhaps in a few instances the surgeon's zeal outran his discretion, but in the majority of cases, as we took the trouble to determine, the symptom complex was such that there seemed every justification for immediate surgery, and many times the patients seemed to be in distinctly worse state than many included in the really acute group. That point is worth laboring. If we continue to teach and preach, as we most certainly should, that immediate operation is justified on the reasonable suspicion of appendicitis, then we must be prepared for a certain proportion of such operations. In one sense they are unnecessary; the patient would have recovered from that special attack without surgery. But in another sense they are very necessary. Among 2,295 patients, 600 had passed safely through previous attacks, sometimes as many as eight, but seventeen of them finally died, exactly as did two patients who had had previous attacks in a group of twenty-five fatal cases in which no surgery was done.

We are particularly concerned in this paper with appendi-

TABLE 1  
Incidence and mortality by age groups in 2295 surgical cases:

	Under 12 Yrs.	13 to 39 Yrs.	40 Yrs. and Over	Total
Total cases .....	426	1645	224	2295
Total deaths .....	37	60	34	131
Mortality rate .....	8.7%	3.6%	15.2%	5.7%

citis at the extremes of life, but in order to comprehend its seriousness in these ages, certain comparisons with the middle group of cases must be made. It is immediately apparent (table 1) that acute appendicitis is a far more serious disease, both in youth and in late adult life, than it is in early adult life, and that it is a far more serious disease in old age than it is in youth. To express it another way, the number of cases in childhood is not quite a fifth of the total number, though the number of deaths is well over a quarter of all deaths, and the number of cases in adults over 40 years is less than a tenth of the total number, though the number of deaths is again well over a quarter of all deaths. Combining the figures, we may say that the 650 cases in childhood and in late adult life represent just a quarter of the total number of cases, while the 71 deaths in those age groups represent well over half of the total number of deaths.

These figures are not peculiar to the New Orleans Charity

Hospital. The infrequency and the high mortality of appendicitis in old persons, "l'appendicite du vieillard" or "appendicite chez les malades ages," as Bernard terms it, is everywhere recognized. Tamammann and Lohmann found only 5.9 per cent of their 2,948 cases in patients over 50 years of age. Patry and Heer found only 31 of 1,058 cases in patients over 45 years of age, which is an even smaller percentage. Lehmann found only 14 patients over 60 years in 1,796 cases of appendicitis in Eiselberg's clinic. But the mortality is out of all proportion to the incidence. Boland's mortality in 411 cases in adults over 40 years is 13.4 per cent, C. L. O. Brown's in 161 cases is 14.2 per cent, and Homans' in 129

TABLE 2

Distribution of pathology by age groups in 2295 surgical cases:

	Under 12 Yrs.	13 to 39 Yrs.	40 Yrs. Onward	Total
Acute and suppurative .....	132	762	57	951
Proportion .....	31%	46.3%	25.5%	41.9%
Rupture, gangrene, etc. ....	294	883	167	1344
Proportion .....	69%	53.7%	74.5%	58.1%

TABLE 3

Mortality in relation to pathology in 2295 surgical cases:

	Under 12 Yrs.	13 to 39 Yrs.	40 Yrs. Onward	Total
Acute and suppurative .....	132	762	57	951
Deaths .....	0	0	3	3
Mortality rate .....	.0%	.0%	5.3%	0.3%
Rupture, gangrene, etc. ....	294	883	167	1344
Deaths .....	37	60	31	128
Mortality rate .....	12.6%	6.8%	18.5%	9.5%

cases is 15 per cent. Goldsmith reports a mortality of 42 per cent in 14 patients over 60 years of age.

The disease is rather more frequent in children than in adults, but at that it does not approximate its frequency in early adult life. McLanahan, for instance, was able to locate only 179 cases in 9 years in the Union Memorial Hospital, and his report is typical of others in that respect, though his mortality, 3.9 per cent, is by far the lowest on record.

Equally striking differences (tables 2 and 3) are seen in the distribution of the pathologic changes in the various age groups. It is exceedingly uneven. To express it as simply as possible, in adults in the middle group the pathologic change had progressed beyond the simple acute or acute suppurative stage in a little over half of all cases—which is a black enough record—but in children more than two-thirds of all cases and in adults over 40 years of age very nearly three-quarters of all cases had progressed beyond that stage.

TABLE 4

Sex distribution and mortality in 2295 surgical cases:

	Under 12 Yrs.	13 to 39 Yrs.	40 Yrs. Onward	Total
Male .....	260	1147	142	1549
Deaths .....	20	42	25	82
Mortality rate .....	7.6%	3.6%	17.6%	5.6%
Female .....	166	498	82	746
Deaths .....	17	18	9	44
Mortality rate .....	10.2%	3.6%	11.0%	5.9%

This series is like most other reported series in that the frequency of the disease in males (table 4) is considerably greater than in females. The mortality for both sexes is the same in the middle group, but after 40 appendicitis is decidedly more fatal in males than in females, while in childhood the reverse is true, though the difference is less striking.

I know that the study of surgical diseases in the negro cannot be as important to surgeons elsewhere as it is to us of the South, but at that, it is not possible, nor is it fair, to discuss statistics from Charity Hospital without analyzing them from the

TABLE 5

Racial distribution and mortality in 2295 surgical cases:

	Under 12 Yrs.	13 to 39 Yrs.	40 Yrs. Onward	Total
White .....	334	1297	159	1790
Deaths .....	25	36	21	82
Mortality rate .....	7.5%	2.8%	13.2%	4.6%
Negro .....	92	348	65	505
Deaths .....	12	24	13	49
Mortality rate .....	13.0%	6.9%	20.0%	9.7%

standpoint of race. Appendicitis is more than (table 5) three times more frequent in the white than in the negro, though the proportion of white to negro hospital admissions is approximately only 4 to 3. The actual mortality, however, is almost 6 points higher in the negro than in the white, and the difference is more marked in both childhood and late adult life. Furthermore, in childhood more than four-fifths of the cases in the negro were of the complicated variety, against two-thirds for the whole age group, and in adults over 40 years the proportion was still higher. The negro incidence at the extremes of life is less than a quarter of the total incidence, but the negro mortality is well over a third of the mortality at those times.

Part of the appalling death rate is unquestionably to be explained by the negro's pernicious habit of postponing medical attention, but in this disease his white brothers share that habit with him, and some other explanation must be sought.

Appendicitis is increasing in the negro—it is surprising, as Matas pointed out many years ago, that it is not a very frequent disease in that race, because of the large amounts of lymphoid tissue in the negro make-up—and surgeons who treat it know to their sorrow that it is a disease of graver potentialities than it is in the white race. The negro child, then, and the negro adult over 40 begin with a handicap when they develop the disease in those periods of life, when it is always more serious than it is in the middle years. Our own explanation of the high negro mortality is that this disease, like all other acquired diseases, tends to be of a graver character when it appears in individuals who once had a true racial immunity to it.

The death rate in very young children is exceedingly high. In the 43 cases under 5 years of age there were 11 deaths, 25.5 per cent, against a mortality of 6.7 per cent (26 cases) in the remaining 383 cases. Four of the 5 nonsurgical cases in children also fall into the age group under 5 years. These figures are not surprising, for part of the explanation of the high mortality in children is their inability to give voice to their complaints, and that trouble is multiplied many times in very young children, in whom the analysis of subjective symptoms must be largely a matter of surmise. At the other extreme of life the mortality is even higher, the death rate in the 9 patients over 80 years of age in this series being 44.4 per cent.

The infrequency, the gravity and the deadliness of acute appendicitis at the extremes of life cannot be explained away as accidental. The trend is too clear-cut for that, and too many contradictions exist. In children, for instance, one would expect appendicitis to be almost as frequent as tonsillitis, for the rather hackneyed comparison of the true tonsil and the abdominal tonsil is sound in that both are lymphoid structures. Fitch's point is well taken, that as interval appendectomy becomes more and more frequent, fewer and fewer persons reach late adult life with the appendix in situ, but until that sort of appendectomy becomes even more epidemic than it is at present, the explanation is not adequate. The reduced incidence of acute appendicitis in both youth and old age is still to be satisfactorily explained.

But the seriousness of the disease is a different matter. In



children acute appendicitis is, just as it is in the middle years, an infectious process, though its virulence is exalted for several reasons, such as the variable location of the appendix in childhood, the thinness of its walls, the inadequacy of the blood supply, its size in relation to the size of the intestine, and the absence of the protection offered in later years by the omentum, which in childhood is always short and transparent. These factors, taken in conjunction with the time factor, which we shall discuss shortly, furnish a more adequate explanation for the mortality than casual statements concerning lowered resistance in childhood; on the contrary, surgeons who operate on children are frequently impressed with their amazing resistance to injury and infection.

A study of the individual records which make up this series shows that in something over two-thirds of the cases in children which had advanced beyond the simple acute or suppurative stage, rupture with abscess formation was the predominant pathologic change. When gangrene was present, it was usually of the patchy variety. But at the other extreme of life the picture is very different. Gangrene was a feature in more than two-thirds of all cases, and it was very frequently of the massive variety. Indeed, it was not unusual to find the note on the operative record that the gangrenous appendix lay free in the peritoneal cavity, cast off by the parent organ, exactly as all dead tissue is eventually cast off. The circulation of the appendix, which is terminal, lends itself particularly well to this type of pathologic change, and Graham points out that congestion is most readily produced in its distal end, the periphery of the vascular field of the appendiceal artery and vein, which is the segment most often diseased. Gatewood says that appendicitis in old age is sometimes of embolic origin, with arteriosclerosis playing a part in the retrograde thrombosis so frequently observed, and all observers know that this type of appendicitis is likely to terminate in mesenteric thrombosis, pylephlebitis, or the metastatic liver abscess first described by Dieulafoy under the name of the appendicular liver.

A particularly interesting case of this sort was observed in a farmer, 63 years of age, who entered the hospital twelve days after the onset of an illness supposedly precipitated by the bite

of a black widow spider. His story was perfectly typical of that condition. He had been bitten on the penis, in an outhouse, during the act of defecation, and both the symptoms and physical signs corresponded with the diagnosis of arachnoidism for which he was treated—lamentably with many purgatives—before he entered the hospital and during the 5 days he was in the hospital before he died. He had denied with “a denial scornful to the point of arrogance,” as Moynihan puts it, any symptoms whatsoever prior to the insect bite, and certainly in view of that history the most astute of clinicians could hardly have diagnosed the state of affairs which was revealed at autopsy, a ruptured and gangrenous appendix, general peritonitis, an ascending pylephlebitis, and a liver riddled with abscesses. It was as perfect a specimen of that type of pathology as one could hope to see, but it does seem a case in which the long arm of coincidence had been stretched entirely too far.

The findings at operation in aged patients are usually typical. The tissues are rather soft, and when the peritoneal cavity is opened there is an escape of fluid, sometimes clear, sometimes turbid, often negative on laboratory examination, even when the illness has lasted many days. Adhesions are few and there is a striking absence of plastic exudate. As a result, when peritonitis is present it is of the spreading rather than the localizing variety. The appendix itself tends to be gangrenous throughout, rather than in patches, as it would be in younger persons, and the gangrene tends to spread even to the cecum. The vascular picture, more than anything else, justifies the assumption that appendicitis at the upper limit of life is very different from the infectious process by which it manifests itself in younger subjects. The structures adjacent to the appendix are, like the organ itself, markedly injected and inflamed, the veins are distended and tortuous, and frequently there is a thrombosis extending into the mesentery and sometimes higher. Indeed, the final picture seen on the autopsy table can almost be predicted from what is seen on the operating table.

The time element in any disease can never be reduced accurately to statistics, but at that, mortality rates and duration of symptoms bear a definite cause and effect relationship to each

TABLE 6

Mortality according to duration of symptoms in 2295 surgical cases:

	Under 12 Yrs.	13 to 39 Yrs.	40 Yrs. Onward	Total
12 hours .....	2.0%	0.9%	15.8%	2.0%
24 hours .....	2.5%	2.1%	10.3%	2.9%
48 hours .....	9.2%	2.2%	12.8%	4.6%
72 hours .....	4.3%	5.7%	25.0%	7.5%
96 hours .....	12.5%	15.8%	12.5%	14.4%
Over 96 hours .....	19.0%	6.2%	20.0%	10.2%
Not stated .....	6.6%	1.3%	0 %	2.0%

other, and that relationship is even more striking when the mortality for each age group is considered (table 6). The rate of rise in the middle years, it will be noted, is nothing like as rapid as it is in the extremes of life, and it is evident that if immediate operation in appendicitis is important at any time, it is doubly so at these times. The insidious onset of the disease, the patient often being ill for days before he realizes that there is anything serious the matter with him, undoubtedly explains the very high mortality for the first 12-hour period in adults over 40, though the lessened sensibilities of old age perhaps play some part also.

It is doubly important that students should be taught and that physicians should realize that the absence of typical signs in appendicitis is even more notable at the extremes of life than it is at other periods. John B. Murphy taught that fever is one of the cardinal signs of acute appendicitis, but it was absent in a fifth of the patients over 40 years, and in 16 of the 426 cases in children, even though children notoriously react to any illness by some degree of pyrexia. Many distinguished surgeons have taught that if pain be not the first symptom, the disease is not appendicitis, but pain was not the first symptom in 37 cases in children and in 22 cases in adults. The disease, in most of those cases, was initiated by vomiting, but other first symptoms included such unexpected ones as a period of anorexia, diarrhea or even a headache. This latter symptom is listed in both Miller's and Freedman's studies also. One does not immediately think that a child with a headache or an adult with a headache is about to develop appendicitis, any more than one would immediately suspect the disease in a child who had just had a tooth pulled, or a child who had had asthma for a week, or who was in the midst of measles or pneumonia. In the nonsurgical cases we studied, one patient with cardiac disease and another with pulmonary tuber-

culosis died of appendicitis without surgery because the surgical disease was lost sight of in the medical condition. One fact that cannot be too often emphasized is that the mere existence of one disease is no protection against the development of another.

A warning should be issued, particularly in children and older persons, in regard to the type of appendicitis that seems to be precipitated by some dietary indiscretion. There were 12 such cases, with 3 deaths, in the children's series, and 7 cases, with 3 deaths, in the adults over 40 years, not counting another fatal case in the latter group which developed in a patient who had just drunk to excess and whose illness was at first diagnosed as acute alcoholism. Stone remarks that dietary indiscretions are too common in children to be of special significance, and perhaps in the etiology of the disease they are not, but the mortality associated with such cases cannot be so lightly dismissed. In the nonsurgical group of cases, for instance, at least one child lost her life because the illness was diagnosed as a dietary affair for eight days before admission and for the two days she was in the hospital before she died, though by that time probably nothing could have saved her. McLanahan considers the possible confusion so serious that if appendicitis cannot be positively eliminated by a reasonable period of observation, he would advise appendectomy, rather than run the risk of withholding it in a case in which it might be needed.

In both children and adults some of the dietary indiscretions in this series were of a most astonishing character. When a child eats 30 apricots, and when a colored man, on being seized at midnight with severe pain and nausea, thereupon rises from his bed and eats two pork chops and a cocoanut pie, washed down by a bottle of beer, one doubts whether the diagnosis of appendicitis could possibly be made, and one feels that there is much to be said in defense of the physicians who, however mistakenly, based their therapy on the obvious facts and gave purgatives to rid the system of the offending food.

Any sort of symptom and any sort of circumstance can initiate appendicitis, and the disease, particularly in late adult life, can take any form at all. Bernard and Jomain divide "*l'appendicite du vieillard*" into three separate types, aside,

of course, from those cases in which the course of the disease parallels its so-called normal course. These types are the gangrenous variety, the pseudo-neoplastic variety, and the pseudo-occlusive variety, and it is surprising how many other writers mention that appendicitis in the aged is frequently diagnosed as intestinal obstruction or carcinoma of the intestine. In the former case operation is usually done at once, in the latter it is delayed for proper preparation, and priceless time is lost.

In our own study, it is characteristic that of the six non-surgical deaths in patients over 40 years of age, the diagnosis should not have been made at all in two cases, the patient with cardiac disease already mentioned, and another who was moribund on admission, and in the other cases should have been carcinoma of the intestine, arachnoidism, as already mentioned, inguinal hernia complicated by nephritis, and inguinal adenitis associated with cardiac disease. In the surgical group the diagnosis was either not made or appendicitis was an afterthought in 37 cases, though fortunately in the majority operation was done without delay. The diagnoses in this group, in which the mortality was more than 25 per cent, included, with perfect justice in most cases, such conditions as peptic ulcer, ruptured ulcer, gastro-enteritis, acute alcoholism, renal disease, intestinal obstruction, biliary disease, carcinoma of the stomach, carcinoma of the cecum, strangulated hernia, ruptured viscus, and tubo-ovarian abscess. Tamammann and Lohmann mention that the diagnosis was missed in more than 10 per cent of their cases, and add acute pancreatitis to the list we have already set down.

If there is a typical onset in older persons, it is something like this: A preliminary story of digestive distress is characteristic; it was noted in 108 of the 224 cases we studied, and probably, with more careful questioning, could have been elicited in more. The indigestion is vague, but is usually of fairly long duration. Then there is a sudden attack of abdominal pain, often waking the patient from sleep, and usually centering around the umbilicus, though it may be localized in the epigastrium. After a period of hours or even days it may become localized on the right side. In other cases it is left-sided throughout, and in still others, as happened in 32 cases in this series, seven of them fatal, it does not localize at all.



Nausea may or may not be present, and vomiting knows no laws. Nausea and vomiting did not occur at all in six cases in this series, every one of which terminated fatally. Chills, diarrhea, constipation, syncope, headache, nosebleed, dysuria, and a dozen other bizarre symptoms were present in other cases and served to confuse the picture.

The physical findings are also not uniform. Right-sided rigidity may be present, but more often there is a uniform soft distention, and Lewin's point is well taken, that the surgeon should not allow the distribution of pain and tenderness to interfere with his diagnosis. Rectal examination, in the absence of abdominal findings, or even in their presence, is often of great value. Lehmann comments on the difficulty of securing an adequate history in patients who are deaf and senile,

TABLE 7

Mortality in relation to purgation in 651 surgical cases:

	Under 12 Yrs.	13 to 39 Yrs.	40 Yrs. Onward	Total
Distribution .....	144	429	78	651
Deaths .....	17	33	14	64
Mortality rate .....	11.8%	7.7%	17.9%	9.8%
Rupture, gangrene, etc. ....	76	330	60	466
Deaths .....	17	33	13	63
Mortality rate .....	22.4%	10.0%	21.6%	13.7%

and another Continental writer comments on the difficulty of eliciting physical signs in old patients who are obese or whose musculature is flaccid. In children, limping or the complaint of pain in the right leg is often more helpful than the abdominal findings.

The onset of the disease may be strikingly different in children and old persons, but after the onset there is at least one point of resemblance, the disaster wrought by purgatives (table 7). The adult begins to doctor himself, the child's parents or nurse begin to doctor him, and the result is the same in both instances. If the purgative is vomited, as often happens, it is given again, and if the patient happens to be a negro, there is almost no limit to the number of times it is repeated or to its drastic properties. All surgeons who have worked with negroes echo that complaint. In this series one negro had taken thirteen purgatives before he entered the hospital, and five and six repetitions are not at all uncommon.

This is an old story, but it should be emphasized again. Moynihan speaks of therapeutic peritonitis, Gerstler says that

the most virulent variety of appendicitis is produced by medical treatment, and both are right, as table 5 shows. A purgative is serious at any age, it is particularly so at the extremes of life, when for anatomic reasons protective adhesions do not form, and when rupture and gangrene take place in an unprepared peritoneal cavity. In both children and adults the taking of a purgative should be regarded as an indication for operation, and the cessation of pain after it is taken should be regarded, as Murphy once put it, as "the last call to operate."

The degree of fever is no particular help, nor is the pulse rate, particularly in the extremes of life, for children tend to react rather quickly to any abnormal state, while in adults the reverse is true. A rapid respiration, while it may mean respiratory disease instead of appendicitis, is rather significant, and in my own experience rather ominous. Of thirty-one children in this series with a respiration rate over 24, twenty-six died, and of nineteen adults with a rate over 24, ten died. The white count, too, is of variable significance and is of no special help in diagnosis. Indeed, the conclusion of the whole matter is that the only way in which one can be certain that the diagnosis of appendicitis will not be missed, particularly at the extremes of life, is by the constant recollection that the condition under consideration may be appendicitis. As Finney puts it, the danger in adult life is that something else may be taken for appendicitis, whereas in children—and, we would add, after middle life—the danger is that appendicitis may be taken for something else.

The case for expectant treatment in appendicitis is not yet settled, but only very occasionally should it enter the discussion of appendicitis at the extremes of life. Almost all authorities are agreed on that point. Eliason's argument is a sound one, that very often the diagnosis of peritonitis is made and expectant treatment is instituted when actually the abdomen is only full of cloudy fluid and the appendix is not even ruptured. Personally, even in the middle years, I adopt expectant treatment rather than surgical treatment with many misgivings, and in children and old persons I cannot see that it has any place. Heyd speaks of those individuals who by the grace of God survive perforation and gangrene and develop localized abscesses, but few of them are children or

adults over 40 years of age. The most cogent argument against delay at any age, and certainly against delay at the extremes of life, is the point first made by Dieulafoy, and for some reason not emphasized as it should be, that peritonitis is not the all-important complication of appendicitis, but rather the toxemia which accompanies the disease and against which temporizing measures cannot prevail. The surgeon who remembers that children and old persons do not endure toxemia well is not likely to practice expectant measures upon patients in those age groups.

Theoretically the patient with a previous attack of appendicitis is aware of his state and seeks medical aid without delay when the condition recurs. That does seem to be the case in children, for both Stone and Freedman have observed, as we did, that children who have had previous attacks of appendicitis are likely to exhibit less severe pathologic changes than children who have not had previous attacks. In this series the mortality for the 86 children who had had previous attacks was 7 per cent, which is lower than the mortality for the whole series in children and considerably lower than for the remaining cases. Perhaps in children a previous attack confers some sort of immunity, though that is pure speculation, but it certainly does not in adults at the upper extreme of life. In this series sixteen patients in the upper age group had had previous attacks, and the mortality among them was 18.7 per cent, which is higher than for the whole series in adults, though why it should be we cannot say.

In the same connection we would stress the importance of prompt interval removal of the appendix if conservative treatment has been followed in an acute attack without suppuration, or if incision and drainage has been done for localized abscess formation. Collier and Potter say that the principle of deferring operation implies that operation will be done, but that is not always true: in 3 cases in this series, 1 in childhood and 2 in late adult life, previous incision and drainage had been done, in one case only 3 weeks before, and 2 of the 3 secondary operations proved fatal.

Time does not permit a lengthy discussion of what should be done at operation. If the appendix can be removed without undue trauma, as it frequently can be in children and adults,

because of the absence of limiting adhesions, it should be removed, but if appendectomy means the extensive destruction of such adhesions, appendectomy should be deferred. As to cecostomy, while we cannot agree with Comb's statement, to the effect that it has only one side, and that a good one, there is no question that it frequently saves lives. That it was used too many times in this series there is little doubt, but if one must choose between using it and omitting it in the borderline case, there is equally little doubt that it should be used, however inconvenient and uneconomic it may be. The very high mortality, 16.5 per cent in 109 cases in children, and the even higher mortality in adults, 35 per cent in 60 cases, furnish no argument against its use. Concerning cecostomy, just as concerning drainage, the debate should be not over the type of procedure used, but over the type of pathology which required the procedure.

In older persons another question occasionally arises at operation, whether some effort should not be made to forestall the thrombosis and ascending thrombophlebitis which occur in a certain proportion of cases. Colp, Koster and Kasman, and Snyder, Marshall and Allen have gone into the matter very thoroughly, and Colp has proposed prophylactic ligation of the affected veins in those cases in which it seems to be indicated. Koster and Kasman advise the procedure when frank suppurative phlebitis exists. Snyder and his co-authors are less positive, pointing out that there is no method of determining in which case such a complication will develop, or in which it will prove serious when it has developed, even in those cases of gangrenous appendicitis in which, after the mesentery is cut, the absence of free bleeding indicates that the veins are occluded. The exposure and ligation of the ileocecal vein adds materially to the risk of the original appendectomy, and should certainly be undertaken only after careful consideration. Finally, the operation of portal ligation, as recent experimental work from my own department (Boyce, Lampert and McFetridge) has shown, is limited to those cases in which occlusion of at least a third of the vein has already occurred and in which neither branch is occluded, and even then it is attended with such difficulties and such risks as to make it a theoretical rather than a practical procedure.

Johns points out that the postoperative course in older patients with appendicitis lacks the resiliency of youth, and that is a correct observation. Such patients frequently drift quietly out of life, as compared with the stormy exit of children, and they often die, as Homans suggests, just because their day is done. Their resistance is low, their functions are exhausted, cardiovascular and cardiorenal disease still further complicate the situation, they tend to develop pneumonia of the hypostatic type, they cannot overcome their toxemia, and they lack the strength and perhaps the will to fight.

In both old persons and young children peritonitis is the most frequent cause of death after appendicitis. In this series it was responsible for 24 of the 37 deaths in children and for 23 of the 34 deaths in adults over 40. I am impressed, as was J. M. T. Finney, Jr., in his comprehensive study, with the very low incidence of subphrenic abscess and pylephlebitis in this series, and my own opinion is that the former condition is diagnosed more frequently than it exists. The other causes of death, which include pneumonia, cardiac and cardiorenal disease, septicemia, toxemia, ileus, shock, anesthesia, cerebral hemorrhage, and mechanical obstruction, need no special comment. In one case, that of a child who died with extreme hyperpyrexia within a few hours after operation, no cause of death could be determined, but the syndrome suggests the type of liver death first described by Charles Gordon Heyd and at present being studied intensively in my own department (Boyce and McFetridge).

#### SUMMARY

1. Out of a total of 2,295 cases of acute appendicitis, special attention is paid to 426 cases in children under 12 and 224 cases in adults over 40 years of age.
2. The infrequency and the seriousness of acute appendicitis at the extremes of life support the theory that the essential pathologic changes at these levels differ from the essential pathologic changes associated with the disease in the middle years of life.
3. Differential diagnosis is considered, with special emphasis upon the atypical character of appendicitis in childhood and late in life.
4. Procedure and causes of death are briefly discussed.



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## THE GROSS DIAGNOSIS OF MAMMARY CANCER

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As is our pathology so is our practice.—OSLER.

The surgery of today is based on pathology. Unless he builds on that solid foundation the surgeon is no better than a hewer of flesh and a drawer of blood.—BOYD.

AT the present time, cancer education is assuming a more important position as affecting both physicians and the general public, and great stress is emphasized as to the importance of early diagnosis. Physicians and the general public are rapidly being educated to the fact that cancer can be cured only as a result of early diagnosis and early appropriate treatment. As a result of this increasing knowledge, many patients are presenting themselves with early or borderline conditions in which the clinical diagnosis may be considerably in doubt. Frequently there is no question as to the diagnosis of mammary cancer before operation, for even today there are still, unfortunately, many patients who have been suffering with cancer for a period of months or years, and who finally seek advice either as a result of repeated urging of relatives and friends, or as final forlorn hope that they may be cured. In this type of case with perhaps a large bulky tumor, possibly ulcerated through the skin and with extensive metastases to the nodes, lungs or liver, there is little difficulty in diagnosis from a clinical point of view. It is this type of case in which the operative or postoperative diagnosis by the pathologist means little beyond an estimation of the degree of malignancy, response to radiation and life expectancy. These cases are obviously malignant and require as radical treatment as possible if it is considered an operable case or, if inoperable, a simple operation for palliation only.

The diagnosis of early mammary cancer presents difficulties and yet the diagnosis must be made if the patient is to be relieved or cured, and here the surgeon and pathologist alike must be familiar with the gross appearance of cancer of the breast in order that appropriate treatment may be afforded

the patient. Many hospitals, especially the smaller ones, do not have a pathologist at hand to render an opinion at the time of operation; therefore the surgeon must frequently be his own pathologist in the operating room and he must be familiar with those features which distinguish a malignant tumor from those which are benign and require less radical treatment.

There are few surgeons, who in the absence of a pathologist are capable of making a frozen section diagnosis of any kind of tumor and there are also many hospitals which are not equipped for immediate diagnosis by this method. Therefore, it behooves the surgeon to be able to interpret correctly the gross features of a tumor or an entire breast in the operating room, and to proceed with further treatment after such examination. On the other hand, frozen section diagnosis has its limitations, for one must be able to recognize the suspicious areas in a breast from which to take a specimen for examination. Just any specimen taken at random from anywhere in the breast may or may not reveal the true condition. The difficulties which are so frequently encountered even in the best of paraffin sections are greatly multiplied in the average hastily and poorly prepared frozen section. With close study and observation cancer of the breast with very few exceptions can be as correctly diagnosed by gross examination as by frozen section, and the percentage of correct diagnoses in cases of mammary cancer will be considerably raised if surgeons and pathologists will realize these facts.

It is not the purpose of this paper to enter into a general clinical discussion of cancer of the breast. On the other hand it is necessary to call attention to some of the clinical signs and symptoms of this form of cancer because of the need to correlate the preoperative evidence with that revealed by the knife.

It is good doctrine that any lump in a woman's breast is better out than in, and yet how many times do we hear of some reputable physician advising a patient not to worry about a lump in the breast until it worries her! We must remember that cancer in its early stages is usually a painless disease, and by the time the tumor actually worries the patient, it is probably too late for treatment to be of more than palliative benefit.

On the other hand, it is not a good policy simply to remove a suspicious nodule from the breast, unless one is prepared to proceed immediately with a radical operation if necessary. If the tumor is clinically malignant or suggests malignancy and immediate laboratory diagnosis is not available, or the surgeon is not sufficiently familiar with the gross diagnosis of malignancy, then it is far better to remove the entire breast and await the pathologic report.

In a great majority of cases "a single, hard nodule, with restricted mobility in an otherwise rather normal breast, is usually cancer." Likewise, "every single, solid, painless lump in the breast at any age should be considered cancer until ruled out by microscopic section" or examination of the entire excised tumor. On the other hand there are occasions when there may be multiple carcinomatous nodules in the breast, as it is not uncommon for cancer to arise in cysts or in chronic mastitis, but in a great majority the malignant tumor is single. The common fibro-adenoma is frequently, though not always, a single tumor, but it is rarely fixed, being freely movable about the breast from one side to the other. A carcinomatous nodule is more or less fixed to the skin, fatty tissue or underlying chest wall, frequently with dimpling of the skin and nipple retraction. There are occasional exceptions to the above wherein a malignant tumor may be freely movable; this sometimes happens in a carcinoma which is confined within a cyst capsule and has not yet involved the surrounding tissues. On the other hand, there are likewise occasional cases in which skin fixation, dimpling, and restricted mobility follow an inflammatory reaction in some benign condition.

A carcinomatous nodule is hard and its hardness is peculiar to itself. Some adenomas are hard but they feel more like a hard rubber ball, there being a slight sense of compression, and the tissue springs back under the fingers. Some cysts under great tension seem to be solid tumors and may give an erroneous impression of the true condition. A few of the carcinomas, those arising in cysts, may give the impression of being a moderately soft or cystic tumor. The organized tissue of chronic mastitis or mazoplasia, is not as hard as that of a malignant tumor; it is more of a resilient feel and not the hardness or cartilaginous texture of cancer.

After the breast has been removed, the breast should be bisected through the tumor area and usually certain features will stand out to distinguish a malignant tumor. The cross-section shows the tumor nodule which presents a cicatricial appearance with small white fibers running outward into the surrounding tissue. A capsule such as is present in the benign tumors, is lacking, except in some of the adenocarcinomas arising in cysts, where the cyst wall is still intact. After rupture of the wall, the tumor becomes diffuse and infiltrating. The fibroadenoma presents a clear cut capsule, sharply outlined against the surrounding tissue. In suspected cancer arising in the wall of a cyst, the scar-like appearance is lacking but certain minute features of malignancy as will be found on careful search. These characteristic features will be outlined later on.

Feeling the mass with the fingers gives clearly the characteristic consistency of these tumors. The carcinomatous nodule is hard, resembling cartilage, while the adenoma is more compressible. Even the extensive involvement of the breast with connective tissue in mastitis does not give the impression of the same hardness as does cancer. The tissue of mastitis is tough, rubbery and somewhat difficult to cut, but never of the scar or cartilage-like texture of cancer.

The color and transparency of mammary tumors are of great importance, for very frequently one may make a correct diagnosis and always gain valuable information simply by looking at the cut surface of the tissue. In the scar-like areas there will be found yellowish or orange opaque streaks or points, varying considerably in size and number. These streaks and points represent the fine ducts filled with proliferated cells undergoing fatty degeneration. The points are the ducts seen in cross section and the streaks are those seen longitudinally. The use of an ordinary reading glass brings out these features clearly. Some of the large ducts may be filled with this debris, which after absorption leaves small cysts. Diffuse carcinoma of the breast in which no definite isolated tumor can be found offers considerable difficulty, though in many cases this type will show these points and streaks throughout the involved area. Occasionally in diffuse carcinoma many sections may be required to establish or rule out



a diagnosis of cancer. Gelatinous or mucoid carcinoma may not show the opaque structure or points and streaks, but a thin translucent gelatinous material which infiltrates into the breast. Traumatic fat necrosis which clinically resembles carcinoma very closely, fails to show the above features of carcinoma when the gross specimen is examined. In some cases hemorrhage and extensive necrosis or infection complicate the picture.

In some of the large tumors which have originated in cysts, filled the cavity and become solid tumors, the entire cut surface may be of this same yellow or pale orange color with an opaque, granular surface from which cellular material may be scraped off with the knife. The benign adenoma presents a white and translucent surface in contrast to the opaque structure of malignant tumors and very little material can be obtained from the surface with a knife. The dense tissue of mastitis is very white, and without the opaque, yellowish points and streaks. It is acellular and scraping the surface brings away practically nothing. Widely scattered cysts of various sizes may be found all through the tissue in productive mastitis, simply obstructed and dilated ducts.

There is another group of cases in which the breast is the seat of a rather long standing mastitis and which feels like masses of cords and small nodules within the breast and without a definite or isolated tumor mass. On section of this type of breast, one may experience considerable difficulty in reaching a conclusion on the gross appearance alone, for there are presented numerous large dilated ducts, all filled with greenish to gray material of the consistency of soft putty. The entire tissue is vascular and edematous, and the gross appearance may be more alarming than necessary, for although the breast is badly diseased, neoplastic changes are frequently limited to within the ducts and infiltration into the surrounding tissue is lacking. Microscopic examination alone can determine the early perforation through the duct wall. The great majority of these cases would be classed as precancerous at the most, and a simple rather than a radical operation performed.

If the *clinical* evidence is not conclusive that the tumor is malignant and a radical operation is necessary, or that it is purely benign and simple operation for removal of the breast

or local tumor will be sufficient, or thirdly that the diagnosis can only be established by examination of the tissue itself, it should be remembered that it is always much safer to remove an entire tumor than to cut into the tumor itself and to remove a small piece for diagnosis. In the first place, by the gross examination of an entire tumor or breast, one is able to get a more comprehensive idea of the true nature of the tumor according to the gross features as outlined above. If the growth is not homogenous throughout, one is able to pick out the more suggestive areas which might be missed entirely in removing a small fragment. Again, there is the danger of dissemination of the tumor by cutting into it for diagnosis. But without question, it seems more logical to assume that the removal of an entire tumor mass by going well around it with cautery or radio-knife is less dangerous than cutting through an intact capsule or across malignant ducts and running the risk of some of the neoplastic cells getting loose in the surrounding tissues and lymphatics. At the same time, more accurate knowledge of the pathologic changes in the remainder of the breast can be obtained through an incision large enough to remove an entire tumor, than through a small skin incision into the tumor. If it is necessary to damage the large ducts leading to the nipple by such surgical procedures, simple mastectomy should be done.

Summing up, we may say that in the gross, mammary cancer with few exceptions presents a (1) single, (2) non-encapsulated (except in carcinoma in cysts), (3) hard, scar-like tumor with a consistency of cartilage, with (4) yellowish points and streaks which are (5) opaque and granular, or in solid carcinoma in cysts, an opaque and granular appearance which includes the entire cut surface. Gelatinous carcinoma and diffuse infiltrating carcinoma offer recognized exceptions.

Finally, I would quote from Ewing, "In certain cases it would appear that the gross diagnosis of carcinoma of the breast is a safer guide to surgical procedure than the discovery by the microscope of questionable minute points of precancerous changes, concerning which doubts and differences of opinion are so frequently expressed. When a suspicious focus is so small that it cannot be detected by the trained eye, it is doubtful if a diagnosis of carcinoma in the clinical sense is justified."

## CANCER OF THE LIP AND INTRA-ORAL MUCOUS MEMBRANE

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**C**ANCER can be cured. However, in order to get such a result it is essential that treatment be instituted before the disease has spread to distant parts of the body. Just how early such a spread or metastasis will occur we do not know. We do know that cancer arising in certain tissues metastasizes early but when situated in other regions the growth may remain local for considerable periods of time. This is particularly true of cancer in and about the mouth. Growths located in the posterior third of the tongue or nasopharynx spread rapidly and early, those located on the lip may remain local for some months or even years.

Those of us who have seen patients die as a result of oral cancer realize how terrible is this disease. Cancer about the mouth rarely kills except by hemorrhage, the result of ulceration into large vessels or as the result of sepsis from the infection which always occurs. These patients are constantly swallowing the septic material cast off from the ulcerating area. The stench, and this is the only word which can describe the odor, is horrible and an early death becomes the wish of all so affected.

The fact that cancer of the lip and oral cavity are surface growths which are easily seen and accessible to treatment makes us feel that our results should be much better than they are. Poor end results are due in most cases to the late institution of treatment and this can occur only for two reasons, either the patient did not seek advice until the growth was well advanced or he was badly advised by those consulted. Unfortunately the latter statement is more or less true. Simmons states that 30 per cent of his cases with mouth cancer were badly advised when first seen.

Although much wealth has been expended and hours of thought and study devoted to finding the cause of cancer we seem no nearer to the solution today than we were at the beginning of the century. Nevertheless certain facts have been

developed as a result of all the work done. We have found that long continued irritation will in suitable subjects be followed by the appearance of neoplastic formation. In the mouth several factors producing irritation may be enumerated and I believe their importance is in the following order: leukoplakia, local infections, tobacco, especially smoking, syphilis and jagged teeth or badly fitting dentures. The last named has, I believe, often been given undue credit for the production of cancer. I have seen a number of cheek cancers I thought due to jagged teeth and a few epitheliomas of the floor of the mouth, but never could be certain that poor dentures played any part in the causation of either.

I feel that of all the factors mentioned, infection plays the most important part. We have been taught that lacerations of the cervix uteri is an etiologic factor in the development of cancer in that structure, but I have yet to see a cancer develop in the scar of a laceration. I feel that in the cervix the role of the laceration is to permit eversion of the mucosa and that infection secondary to this eversion or chronic cervicitis is the underlying factor in cancer in this locality.

When we consider the incidence of intra-oral cancer we find that it is many times more frequent in men than in women. This is easy to explain upon the basis that women naturally pay more attention to oral hygiene than men.

Whether tobacco, especially smoking, plays any role in the production of oral cancer will possibly be determined in the next half century. In the past three decades smoking has been taken up by women and if tobacco per se is an important factor in cancer production we would expect to see a marked increase of oral cancer in women. As a matter of fact such has been noted by Macklin, who states that the incidence of lip and mouth cancer among women has increased ten times in the past 30 years.

I am of the opinion that infection, plus the irritation of tobacco leads to the development of leukoplakia and in my experience leukoplakia frequently precedes the appearance of cancer. Therefore the first step in any campaign against cancer of the lip and mouth should be directed toward the treatment of leukoplakia, to the elimination of infection and to the eradication of sharp edged teeth.

As already noted, the factors producing irritation must exist in a suitable subject. I believe that cancer *per se* is not an hereditary disease. I do think that just as characteristic familial features are seen in the second and third generations so could the likelihood of abnormal cell growth following certain stimulation be transmitted to offspring. In the more susceptible subject the irritation from infection, jagged teeth, etc., need not necessarily extend over any great period of time to produce malignancy, whereas in those having no such inherited tendency, the irritation might continue throughout life without the development of carcinoma.

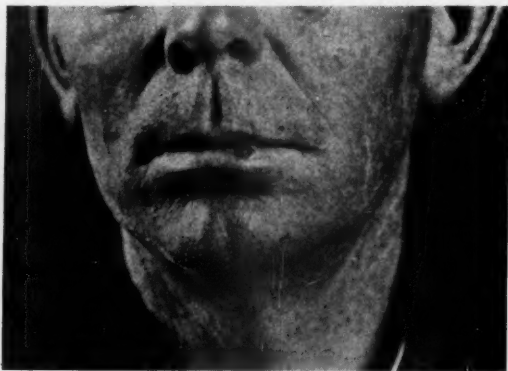


FIG. 1. Mr. T: Squamous cell epithelioma lip in April, 1920, before treatment.

In a large series of cases of lip and mouth cancer the incidence of syphilitic infection is about 18 per cent. What part syphilis plays in the actual causation of the disease I cannot say, but I believe that it is greatly over-estimated. The importance of syphilis lies in the fact that a diagnosis of syphilis is made when there is a suspicious looking lesion on the lip or soft palate and the Wassermann reaction is positive and frequently the real condition is not realized until too late. It must not be forgotten that a syphilitic person may have cancer and if the lesion persists after two or three weeks of intensive treatment I would advocate the removal of a section for microscopic study.



## CANCER OF THE LIP

This may occur in one or two forms, either a horny papillary growth which protrudes from the surface of the mucosa, which slowly enlarges and also slowly invades the deeper structures. The other type appears at first very much like an herpetic lesion. It crusts, comes off, leaving a raw surface, and later again crusts. This repeats itself and in the meantime the growth continues to penetrate the tissues, the lip becoming hard and firm and ulceration beginning.

Cancer of the lip is much more frequent in men than in women. In my series of sixty-four lip cancers the ratio is 15 to 1. Most often the growth appears on the lower lip: my



FIG. 2. Mr. T.: Result of radium therapy. Photograph taken in June, 1920. The patient is still living and well, and shows no sign of recurrence.

series of epithelioma of the upper lip occurred in only nine cases. On the lip, as well as within the mouth, it is not uncommon to observe the presence of two or more growths occurring simultaneously in different areas apparently independent.

## CANCER IN THE MOUTH

Certain areas within the mouth, due possibly to peculiar structural characteristics, appear to have a predisposition to epithelial overgrowth, namely, the palatoglossal sulcus, the anterior two thirds of the tongue and the floor of the mouth. According to Fraser, 20 per cent of intra-oral cancers occur in the first named area, 43 per cent in the second and 10 per cent in the floor of the mouth. My own figures are a little

at variance with the above, due probably to the small series. I have had sixteen cases of cancer of the tongue, thirteen of the anterior two thirds of the tongue and one of the posterior third of the tongue and two of the palatoglossal sulcus. I have had seven cases of cancer of the floor of the mouth, most of which occurred near the frenum of the tongue.

#### CANCER OF THE TONGUE

Cancer arising in the posterior third of the tongue will usually fall in group IV of Broder's classification. The cells are of the embryonal type, metastases occur very early and I have



FIG. 3. Mr. B., aged 25: History of small spot on lower lip for one year. When first seen Nov. 5, 1933, glands were present on both sides of the neck. Treated by radium application to lip and dissection of both sides of the neck followed by x-ray radiation.

not been able to save any of the three I have treated. Unfortunately this neoplasm gives no early signs of its presence and usually the patient consults his doctor because of stiffness of the tongue or some trouble in swallowing. If ulceration is present it is seen only with difficulty and then usually only with a laryngeal mirror. The extent of involvement is best learned by palpation after suitably anesthetizing the pharynx.

Growth in the anterior two thirds of the tongue fortunately make up the largest group of tongue cancers. It appears either as a nodular tumor or at times as an ulcerative lesion. It is practically always located along the margins of the tongue and I have yet to see an epitheliomatous ulcer of the center of the

tongue except as a result of extension from a primary focus situated elsewhere. This tumor is, as other cancers within the mouth, a squamous cell epithelioma.

The seven epitheliomas which I have observed occurring in the floor of the mouth have all been ulcerative lesions. It also is of the squamous cell type usually falling into group I or II of Broders' classification. While histologically cancer of the floor of the mouth is not particularly malignant, on account of its free lymphatics and its nearness to the gland-bearing region metastasis is early and the condition is, in my opinion highly malignant clinically. Of these seven patients four had growths beneath the left side of the tongue and all



FIG. 4. Mr. B. shows complete disappearance of local lesion. The glands removed from both sides of the neck and submental region showed squamous cell carcinoma.

of these are well more than three years without evidence of recurrence. Of the other three cases, one is alive and well eleven years, one I have been unable to trace and the other who had glandular involvement extending down to the clavicles on both sides when first seen lived two and a half years after the institution of treatment and died of extension.

Another rather frequent site of oral cancer is the cheek. I have had eighteen such cases, all of which were squamous cell in type and of those seen since Broders published his classification of cancer based on the microscopic characteristics of the neoplasm, all have fallen into groups I and II. Of the eighteen cases I have been unable to follow three. Of the remaining there are seven dead and eight alive, some of whom were treated more than five years ago.

In my series the cancer which arises in the cheek in the angle formed by the ramus of the mandible and the superior maxilla has responded the least to treatment. Periosteal involvement is frequently present when the patient first consults the physician and you who have had any experience with malignancy know that when the bone becomes involved cure is practically impossible and amelioration hard to obtain as recurrence is early even after what appears to be complete eradication of the disease.

Reviewing my cases of cancer of the cheek I note the exceedingly rapid growth of some of them, especially when there was marked oral sepsis. This may have been due to the invasion of the tissues about the neoplasm by infecting organism. As a matter of fact Vincent's rods and spirochetes were present in all observed cases and this type of infection may break down the normal tissue resistance to neoplastic cells. I have furthermore noted as has been observed by others that such cases are much more radio-resistant than similar types of growths where no such infection exists.

In all ulcerative lesions especially those of the gum, cheek and palatine arches the possibility of trench mouth must be considered. Smears should be taken from such areas and even though positive for the Vincent type organism if no improvement is noted within a short time after appropriate treatment, sections from the edge of the ulcer should be examined by a competent pathologist.

#### TREATMENT

To date many remedies have been tried for the cure of cancer and most have failed. This does not mean that we should not continue to experiment. Possibly some obscure physician may discover a simple remedy which may eradicate this dread disease. The cure may be found long before the cause of the disease is discovered, just as it was known that quinine or cinchona would cure malaria long before the cause of the disease was known or its method of spread even suspected.

So far three methods employed in the treatment of malignancy have stood the test of time. Surgery or the eradication by removal, heat or cauterization as with the actual cautery

or the newer methods of electro-desiccation or coagulation and lastly radiation either by radium or x-ray therapy. He who depends upon one method to the exclusion of the other two is not giving his patient the best chance. Some cases should be treated by radiation and others by surgery and

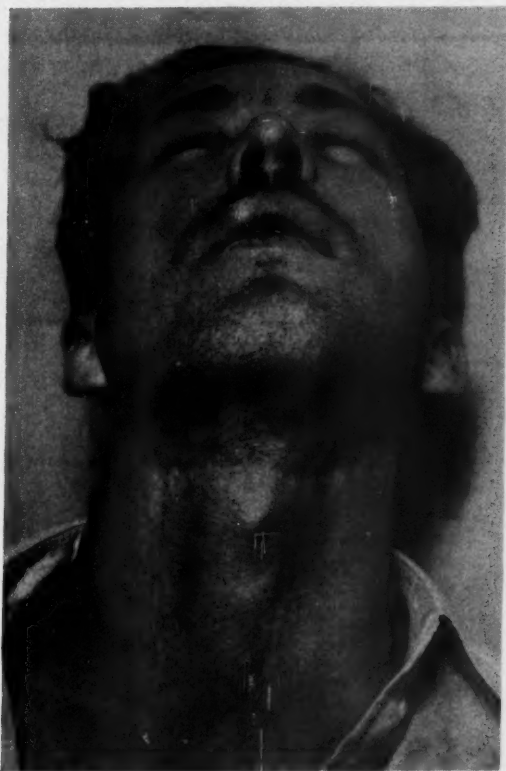


FIG. 5. This photograph and also Fig. 4, were made July, 1935, eighteen months following treatment. There is no evidence whatsoever of any recurrence. The operative scars are scarcely noticeable.

probably most by a combination of two or of all three methods.

The treatment of malignancy of the lip and oral mucous membrane should be considered under two different headings. First, the treatment of the primary lesion and second, the treatment of metastases.



Cancer of the tongue and buccal mucosa metastasizes early. In a study of 367 cases by Simmons, 64 per cent had consulted a physician within one month of the time of the first appearance of the growth and of these two thirds had glandular metastases when first seen. The extension of cancer from the lip and mouth is along the fascial planes by way of the lymph vessels to the glands of the submaxillary area. From this locality the spread is into the deep glands of the neck which lie to the side of the great vessels and also to the glands of the posterior triangles of the neck. Metastasis from cancer of the lip does not occur so early as from the areas previously mentioned but involves the same glands.

#### PRIMARY LESIONS

The treatment of primary lesions of the lip varies with the state of the lesion when first seen. Frequently this lesion is a small crusted area or superficial ulcer with firm whitish edges. For these I prefer surface application of radium properly screened and for sufficient length of time and in practically all cases obtain a permanent cure. In those cases where the infiltration extends deeper into the soft tissues the surface applications may be reinforced by the insertion of radium needles through and under the growth. It should be borne in mind that cancer grows from its edges and it is therefore of the utmost importance to treat not only the growth but also the surrounding tissue.

In some cases especially with ulceration or in those recurring after x-ray or radium we have deemed excision the better method of treatment. Personally I prefer the scalpel or radio-knife (so-called) to perform this procedure. Other surgeons, notably James and Clark, prefer electro-desiccation in this type of case and electro-coagulation in the more superficial growths.

#### TONGUE

I have long felt that cancer of the tongue is best treated by interstitial radiation with radium needles. Gold Radon seeds have proven excellent in the hands of many workers in this field but I have had no experience with them. For years it has been my practice to excise the local lesion on the tongue,

if small, so that tissue may be obtained for study. This can be done with the radio-knife or if a scalpel is used the resulting raw surface should be immediately cauterized with the electro-cautery. I treat operable growths of the floor of the mouth similarly, excising the lesion first. I then implant radium needles about the area of the growth if the tongue is involved or about and into the area of infiltration when the floor of the mouth is the location of the neoplasm. In the massive infiltrating growths of the tongue or floor of the mouth no attempt is made to excise any tissue. Radium needles are inserted into and about the growth and allowed to remain a little less than that period of time which would produce sloughing. The interstitial radiation is supplemented by external radiation with the high voltage x-ray. Quick states that the lethal dose of x-ray of the average squamous cell intra-oral cancer lies between 7 and 10 skin erythema doses if delivered within a period of 10 to 20 days. There is no fixed rule of treatment and Ewing has aptly said that the factors entering into radio-sensitivity or resistance are varied and that each tumor must be analyzed by itself in accordance with its known structure and clinical behavior.

Where radium is used Grier feels that adequately screened surface applications are preferable to interstitial radiation with seeds or needles. He states, and I have to agree, that the possibility of infection due to insertion of the needles is obviated by this method. However, in my own cases there has been but little if any infection following the insertion of radium needles and I believe that by their use deeper areas may be reached with sufficient dosage to destroy the cancer cell. In cancers within the mouth infection is always to be avoided as it seems not only to stimulate the rapidity of growth but according to Pack the radio-sensitivity of the neoplasm is also diminished.

#### CANCER OF THE CHEEK

In these cases we combine as we do in extensive tongue lesions, internal radium therapy with external x-ray radiation. In the cheek I employ surface application of radium rather than interstitial radiation with needles although occasionally I combine the two methods especially in those lesions lying

between the ramus of the mandible and the superior maxilla.

So far we have concerned ourselves only with the treatment of the primary lesion. Before discussing the treatment of the metastases I would like to impress upon you the importance of the very first treatment which is given to the primary growth. If radium is employed the dosage should be amply sufficient to destroy the neoplasm. If complete destruction is not obtained the tumor increases in its resistance to radiation with each succeeding failure and soon the case becomes hopeless from the standpoint of radium treatment. The basis of all radio-therapeutics is the fact that cancer is more radio-sensitive when the cells are in mitosis, that the more embryonal the type of cell the more sensitive it is to radiation therapy. To be able to treat malignant neoplasms successfully requires more than the mere application of radium. Pfahler has well said that the possession of radium is of no more consequence in itself than the possession of a set of surgical instruments, it is the skill in their use which counts. Poor results following ineffectual treatment deters many patients and physicians from employing radiation in the treatment of lesions about the mouth. We must remember that most of these lesions are of the squamous cell type and radio-resistant and therefore full dosage is necessary.

#### METASTASES

Does the treatment of the local lesion, be it lip, cheek or tongue conclude our responsibility to patients the victim of this disease? To my mind no, the fact that not infrequently metastasis occurred previous to the time we see the patient should not be overlooked. No signs of secondary involvement may be present, yet this does not mean that such does not exist. Fischel in a large series of mouth cancers states that 70 per cent of those having no palpable glands showed cancer in the lymph nodes following operation. For years I have realized that such probably was true and in all cases which are operable I do dissections of the neck. I believe, however, that the primary lesion should be treated first so that there is little chance of spread into the operative field.

My experience is such that I am forced to conclude that both sides of the neck should be operated upon when the growth

is anywhere near the midline. It is my practice to be more radical in the operative procedure on the side of the lesion but I have found cancerous glands sufficiently often on the other side to warrant the added surgery. In the aged and debilitated the operation should be divided into stages, doing the side of the lesion first followed some five to ten days later by dissection of the other side. Five or six days after the completed operation I institute x-ray therapy over the neck.

Great advances are being made in the x-ray treatment of malignancy. Whether it will eventually replace surgery in the treatment of metastatic neck lesions remains to be seen. Blair advises radical dissection of the neck when possible but goes on to say that "supposed" cures from radiation have increased since 1928. Birkett states that radiation is satisfactory in the primary lesion but the problem of lymphatic involvement is not solved. It is my experience that by radiation cervical involvement may be held in abeyance but I have yet to see the case where the glands were invaded with cancer that has remained cured by radiation alone.

There is still one type of intra-oral cancer to be mentioned namely carcinoma of the tonsil and so-called lympho-epithelioma of the naso-pharynx. I have had one case of each. This growth is characterized by the lymphocytic infiltration present in the cancerous tissue. It is highly malignant and highly radio-sensitive and rapidly recurs unless completely destroyed. Metastases occur not only locally into the neck but systemic involvement is rather frequently noted. This occurred in one tonsillar case and had evidently taken place previous to the time that I saw her inasmuch as she died a year and a half later of internal metastases without local recurrence in the neck or tonsil. I have not been able to follow the other case but I am sure cure is out of the question.

In conclusion I wish to emphasize that in medicine everything apparently goes in 3's or multiples thereof. In the treatment of malignancy the old figure 3 still holds sway. We have three established methods of treatment, surgery, heat and radiation. So likewise for the successful management of the cancer patient three individuals at least are necessary, a radiologist familiar with the physics of radium and x-ray therapeutics, a pathologist competent to diagnose cancer on

the appearance of the malignant cell and versed in the grading of malignancy and the estimation of radio-sensitivity and lastly a surgeon familiar with cancer and its mode of spread, fearless in his attack upon the disease yet ever mindful of his responsibility to the patient.

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## WE HAVE DONE IT!

**I**N 1932 many thought that nobody but a big fool would attempt to start a new professional journal. Many doctors thought that too many journals were already being published and that the South neither could nor would support a journal devoted exclusively to surgery. A little band of brave men, however, while fully realizing that the nadir of the depression was not an auspicious time to launch a new enterprise, believed in their hearts that the South was able to issue a creditable surgical journal and that, once proved not a flash in the pan, the South would support such a journal. Time has proved that they were filled with courageous vision and not foolhardy vapors.

Launched thus as a quarterly, THE SOUTHERN SURGEON is now at the end of its fourth year a bi-monthly. This has meant an increase in 1935 of more than 130 pages of reading matter over last year—and the Sheriff has not yet been even sighted on the horizon. Each of the ten states embraced by the Congress, seven other states and the District of Columbia have been represented. Or, thirty papers read before the Congress and twelve others have appeared. The manuscripts of three papers read before the 1935 Assembly are on hand, and those of the three others have not yet been received. Two

more numbers will appear before the 1936 papers will be available. The immediate future is therefore a particularly propitious time to submit papers.

In one vital respect THE SOUTHERN SURGEON has fallen short of the mark set for it by its founders. It has received few virgin efforts from the younger generation of surgeons here in the South. Many of our contributors have won such reputations that anything they may write will be welcomed by the biggest surgical journals in the country: and let it be repeated, an author's fame does not debar him from these pages. But we would rather have a moderately good paper based on his own experience from a young fellow who has never burst into print before than a very good paper based on work reported thirty years ago (even though supported by subsequent observations) from the country's most famous surgeon. The Editor unfortunately knows personally few brilliant young surgeons who live at a distance from the office of publication but he again begs such men of ambition for original contributions.

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### SCIENTIFIC EXHIBITS

THE Convention of the American Medical Association is a little bewildering to one who attends it for the first time. Many fine papers are being read at the same time and to listen to as many as possible might provoke mental indigestion. Then too one has a chance to read the papers later in the quietude of his office and to ponder over them. Some physicians have felt more than repaid for attending a Convention without hearing a single paper: one may well spend all his time studying the exhibits. The scientific exhibits present graphically the fruits of a world of work by devoted, enthusiastic men and constitute a post-graduate education in themselves. The exhibitors are eager to explain any detail to those who manifest an interest and take pleasure on adding little anecdotes connected with the work that help one to remember and evaluate.

The commercial exhibits of new books, drugs, instruments and appliances are of hardly less educational value. Though on a much smaller scale than those of the A. M. A., the com-

mercial exhibits at the New Orleans Assembly of The Southeastern Surgical Congress will be more varied and interesting than ever before: very little space is still available for exhibitors.

The scientific exhibits at the Assemblies have been uneven. In 1933 a surgeon wrote in at the last moment asking for space which was allowed him. In 1934 the physical layout did not allow for them. At the Jacksonville meeting the few exhibits were excellent. A large amount of space for scientific exhibits will be available at the New Orleans Assembly. While we hope the medical schools of Tulane and L. S. U. will provide the backbone, we are appealing to every fellow who has something to show to communicate with Dr. Beasley.

**A Happy Christmas  
and  
Successful New Year  
to All**

**MAY YOUR YULETIDE BE ONE OF PEACE  
AND HAPPINESS WITH PROSPERITY  
ATTENDING YOU THROUGHOUT  
THE NEW YEAR**

***The Southern Surgeon***

## BOOK REVIEWS

*The Editors of THE SOUTHERN SURGEON will at all times welcome new books in the field of surgery and will acknowledge their receipt in these pages. The Editors do not, however, agree to review all books that have been submitted without solicitation.*

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**SURGERY: QUEEN OF THE ARTS and Other Papers and Addresses.** By WILLIAM D. HAGGARD, M. D., F. A. C. S., D. C. L., Nashville, Tennessee. Professor of Clinical Surgery, Vanderbilt University School of Medicine; Surgeon for Vanderbilt Hospital and St. Thomas Hospital; President The Southeastern Surgical Congress; former President of the American Medical Association, the American College of Surgeons, the Inter-State Postgraduate Medical Association of North America, the Southern Surgical Association, and the Tennessee Medical Association; formerly Lieutenant-Colonel, Medical Corps, U. S. A.; Consultant in Surgery, Mesves Hospital Center, A. E. F. With foreword by WILLIAM J. MAYO. 389 pages with 41 illustrations. Price \$5.50. Philadelphia and London: W. B. Saunders Company, 1935.

"Surgery: Queen of the Arts" created a nation-wide sensation when it was delivered last year in Chicago, and this sensation was by no means confined to the medical profession. Many of us felt that such an exquisite poem should be presented in permanent form, and now our wish is granted. In addition to other addresses of a general nature and several biographical sketches of famous surgeons of the South, there are reprinted some splendid clinical papers. In passing, it is interesting to note that a boy of 9 who lost 42 inches of his ileum for sarcoma is now enjoying good health at 26. Other old papers have also been brought up to date. The scintillant surgical papers more than justify the volume.

The Fellows of The Southeastern Surgical Congress who unanimously elected Dr. Haggard their president last year and who have not already secured their copies need only to be told that an evening with this volume is the next most delightful thing in the world to an evening with its author.

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**CLASSICAL CONTRIBUTIONS TO OBSTETRICS AND GYNECOLOGY.** By HERBERT THOMS, M. D., Associate Professor of Obstetrics and Gynecology, Yale University. With a foreword by HOWARD A. KELLY, M.D., Professor Emeritus of Gynecology, The Johns Hopkins University. 265 pages with 56 illustrations. Price, \$4. Springfield and Baltimore: Charles C Thomas, 1935.

Osler it was, if a by no means infallible memory serves aright, who revived interest in medical history. When the late great Dr. Welch became Professor of Medical History at the Hopkins, it was he who emphasized the importance of securing facsimiles or at least copies of the medical classics. The medical profession owes a big debt to Mr. Thomas for making so many of these classics available to the man of modest income.

This book presents in English fifty-nine selections from the works of great medical authors whose contributions and discoveries have furnished foundations of knowledge of obstetrics and gynecology. The selections deal largely with clinical aspects of these subjects and the transcriptions are somewhat fuller than usual. The numerous portraits of the dignitaries add interest.

Many of us may be surprised to find that if William Harvey had not discovered the circulation of the blood, his writings as an obstetrician would have entitled him to a secure niche in history. It is inspiring to read Ephraim McDowell's own words in describing the first removal of a diseased ovary. The next issue of the *SURGEON* will carry more about him. Oliver Wendell Holmes' "The Contagiousness of Puerperal Fever" impresses upon one that "The Chambered Nautilus," though enough to insure immortality to any one man, was one of his lesser achievements. Other selections from Hippocrates to Marion Sims are of hardly less interest.

The selections have been carefully made and there is just enough in the way of biographical data to set them off. The book is truly inspiring. If it had no other claim to interest or consideration, it would still be invaluable as a model to any physician who aspires to tell the world of his discoveries or experiences.

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**THE STOMACH AND DUODENUM.** By GEORGE B. EUSTERMAN, M. D., F. A. C. P., Head of section in Division of Medicine, The Mayo Clinic, Professor of Medicine, The Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota; and DONALD C. BALFOUR, M. B., Head of Section in Division of Surgery, The Mayo Clinic, Professor of Surgery The Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota; and Members of the Staff, The Mayo Clinic and The Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota. 950 pages with 436 illustrations. Price, \$10. Philadelphia and London: W. B. Saunders Company, 1935.

To William James Mayo and Charles Horace Mayo this great book is most fittingly dedicated. The distinguished brothers have contributed a foreword, in which the book is briefly and justly described:

"A successful attempt has been made to correlate briefly the fundamental facts of the diseases of the stomach and duodenum, and their relationship to other diseases, and to develop those methods of clinical investigation which past experience and advancing knowledge put at the disposal of the medical practitioner, whether or not he is a specialist. Here a group of men have systematized the actual practice of medicine in the field of gastroduodenal diseases, and have presented concisely and cogently not the general opinions of a number of men, but the opinion of a group who are working together as one man on the patient in the attempt to give the patient the advantage of what is known. The book serves to present in co-ordinated form what we have learned in an important field of medicine."

Chapters on history, applied physiology, experimental surgery, surgical pathology, necropsy, anesthesia, x-ray, diagnosis, diaphragmatic hernia, pyloric



stenosis in infants, and postoperative pulmonary complications have been contributed by Wilbur, Alvarez, Mann, MacCarty, Robertson, Lundy, Kirklin, Harrington, Helmholtz and Lemon respectively. A chapter on bacteriology was not contributed by Rosenow. One notes too that the role of ulcer in the etiology of gastric carcinoma is not so grossly emphasized as it has been at the Mayo Clinic, though the impossibility of distinguishing cancer from benign ulcer is repeatedly stressed.

From this book, the general practitioner, the internist and the gastroenterologist will each learn much about the medical aspects of diseases of the stomach and duodenum, and will find good grounds for encouragement to their patients who need surgical care. The surgeon, on the other hand, will learn a great deal about what kind of patient to leave in less radical hands and he may learn a good deal about surgery.

"The Stomach and Duodenum" represents the Mayo Clinic at its very best, and, in the opinion of this reviewer at any rate, that best is very, very fine indeed.

**MECHANICS OF NORMAL AND PATHOLOGICAL LOCOMOTION IN MAN.** By ARTHUR STEINDLER, M. D., F. A. C. S., Professor of Orthopedic Surgery. The State University of Iowa, Iowa City. 424 pages and 416 illustrations. Price, \$8. Springfield and Baltimore: Charles C Thomas, 1935.

This book is beautifully gotten up. It contains references to Hippocrates and to papers that have appeared in American orthopedic journals in the past year. It contains abstruse mathematical formulas far beyond this reviewer's comprehension and snapshots of University of Iowa athletes in action. It should prove of the greatest interest and value to orthopedists and physiologists, but it is feared that it will also prove caviar to the general.

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